

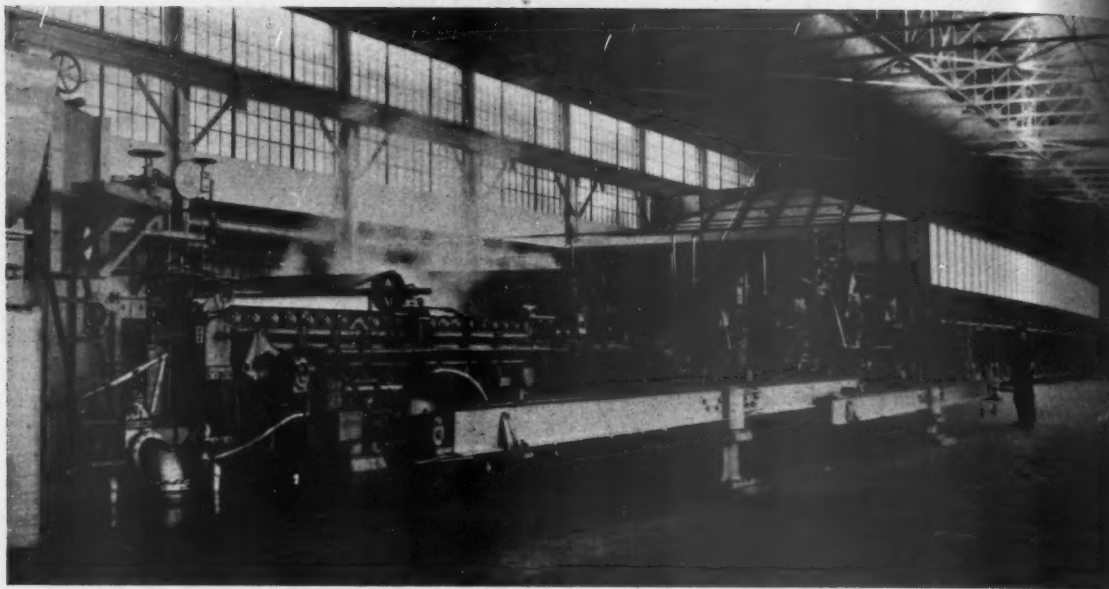
PACIFIC PULP & PAPER INDUSTRY

JULY
1932



VOLUME 6
NUMBER 6
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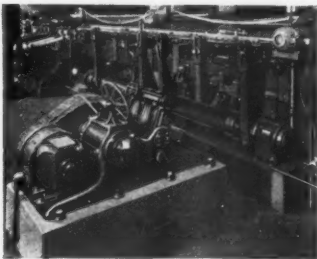
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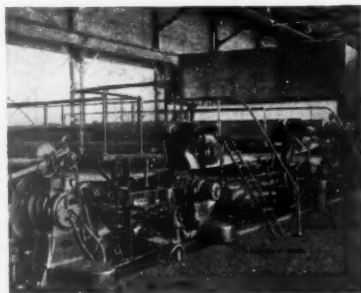
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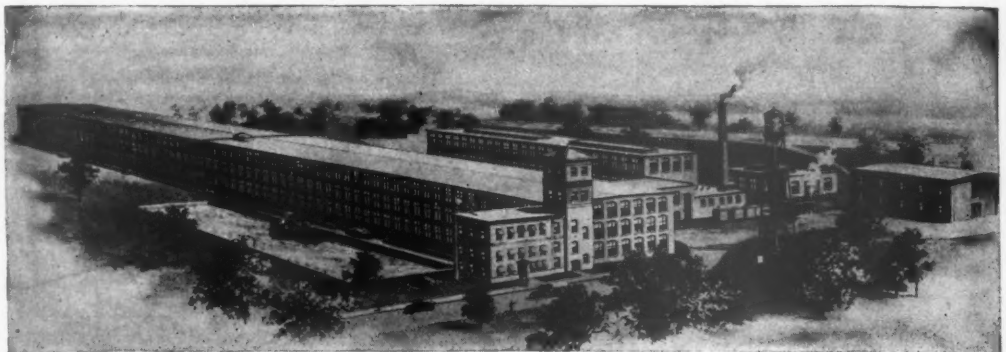
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INDEX OF ADVERTISERS

Albany Felt Co..... 2
Beloit Iron Works..... 1
Brubaker Aerial Surveys..... 37
California Cotton Mills..... 36
Cameron Machine Co..... 33
Carthage Machine Co..... 38
Congress Hotel..... 29
De Guere, L. A..... 40
Downingtown Mfg. Co..... 26
Draper Bros. Co..... 31
Du Pont, E. I. De Nemours
& Co..... 3
Eastwood Corp..... 35
Edison Storage Battery Co..... 37
Ferguson & Co., Hardy S..... 40
Freeport Sulphur Co..... 35
General Dyestuff Corp..... 30
General Electric Co.....
Outside Back Cover
Glens Falls Machine Works..... 38
Great Western Electro-Chemical
Co..... 6
Griffith Rubber Mills..... 37

Hardy, George F..... 40
Hardy & Sons Co., Wm. A..... 37
Heller & Merz Corp..... 35
Hodges, Walter S..... 36
Huyck & Sons Co., F. C..... 24
International Wire Works..... 38
Internationaler Holzmarkt..... 39
Jones & Sons Co., E. D..... 33
Kuppler's Sons Co., Chris..... 40
Lindsay Wire Weaving Co..... 37
Lockport Felt Co..... 31
Merrick Scale Mfg. Co..... 34
Mine & Smelter Supply Co..... 36
Montium de la Papeterie
Belge..... 39
Newhall, Charles..... 40
Orr Felt & Blanket Co..... 29
Pacific Coast Supply Co..... 37
Paper Converting Machine Co..... 34
Paper Makers Chemical Co..... 34
Papier Fabrikant..... 39
Papier Zeitung..... 39

Pennsylvania Salt Co.....
Inside Front Cover
Puget Sound Power & Light
Co..... 38
Pulp Bleaching Corp.....
Inside Back Cover
Roberts Mfg. Co., F. W..... 38
Schoenwerk, O. C..... 40
Selden, Stanley J..... 40
Shibley Co., Inc..... 38
Shuler & Benninghofen..... 30
Simons, V. D..... 40
S. K. F. Industries, Inc..... 34
Stebbins Engineering & Mfg.
Co..... 35
Svensk Travaru Tidning..... 39
Tacoma Electrochemical Co.....
Inside Front Cover
Texas Gulf Sulphur Co..... 32
Turner Halsey Co..... 32
Union Oil Co..... 4
Union Screen Plate Co..... 36
Waldron Corp., John..... 38
Waterbury & Sons Co., H..... 33
Zellstoff & Papier..... 39

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What do you know about the vast Western industries which
manufacture products, other than pulp and paper, from our
forest raw materials?

Complete your picture now. Tear out this advertisement
and mail it to us with your name and address. You will
receive a sample copy of the only Western woodworking
journal, together with a subscription offer.

**Western Wood Worker &
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71 Columbia St., Seattle, Wash.

THE BACKGROUND OF PULP AND PAPER

Every pulp and paper mill man who looks beyond the
chipper and pulpwood pile, finds a most important field
of vision. Forests, lumber, these form the background of
pulp and paper.

Keeping apace of developments in the lumbering field,
as directly affecting your business, is well worth while.
This can best be done by reading the leading lumber
journal, *West Coast Lumberman*, each month. Sub-
scription, \$3.50 per year, including the Annual Review.
Foreign, \$4.00.

WEST COAST LUMBERMAN

71 Columbia St.

Seattle, Wash.

Western newsprint *steps out*

HIGH-SPEED PRESSES, the introduction of color into newspapers, and the more exacting requirements of advertising technique make publishers' needs more exacting for brighter newsprint.

To meet this demand, research engineers of the Great Western Electro-Chemical Company have now perfected a process of groundwood treatment which yields a brighter newsprint sheet from the darker Pacific Northwest hemlock than has ever been hoped for from the bisulphite treatment, and which definitely places Western newsprint on an equal plane with newsprints made from spruce grown in the colder regions of the Eastern States and Scandinavia. The Great Western process is already standard practice at several Pacific Coast mills.

The new treatment employs zinc hydrosulphite, a chemical hitherto little known as a commercial agent. It is being successfully used even on discolored woods



to produce a photometer reading previously impossible. As compared with the 18- to 20-hour retention period necessary for sodium or calcium bisulphite treatment, zinc hydrosulphite is consistently completing its treatment *in a few minutes*, with obvious savings in cost and time.

Zinc hydrosulphite requires no special equipment for application. It is non-corrosive, since the pH value of the pulp is unchanged. Its development marks one more significant contribution to the pulp and paper industry by Great Western engineers, who have consistently pioneered in anticipating the need for new products and methods to improve pulp and paper quality.

We shall be glad to provide detailed information in answer to inquiries, and Great Western technical men are available to assist in experiments and final application.

GREAT WESTERN ELECTRO-CHEMICAL CO.

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PLANT: PITTSBURG, CALIFORNIA
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THE NEXT STEP

AT no point in the hearings on the depreciated currency legislations before the House Ways and Means Committee was the full strength of the proponent forces demonstrated. Strong testimony was introduced by a number of different groups, but it was not made clear to the Committee just what an important part of the industry saw the need of and actively favored some emergency legislation to protect investment of American capital in American plants and preserve American employment opportunities to American workmen.

There was a great deal said by the opposition about the 500 paper mills depending on imported sources of pulp. The emphasis was carefully focused upon the number, because such emphasis was impressive, particularly when it was pointed out in comparison that only some 20 independent pulp mills existed as a purely American source of pulp supply.

That comparison is not quite according to fact. The comparison is not found in numbers, but in the total investments and employment represented. Every American mill that has an investment in pulp manufacturing is directly subject to damage by the depreciated exchange evil.

In the first instance a check of the 500 mills claimed by the opposition (actually they were only able to show 236 on their brief) revealed that in some cases one organization which had a number of divisions, that all taken together constituted only one plant, would be listed as many as nine times. Further, many of these mills were so small that even a dozen of them could scarcely show a combined capacity as large as a moderate-sized modern mill. Others used very little wood pulp as compared to other materials, e. g., waste paper. Again, the Southern group of mills, which runs very largely to pulp manufacturing as well as paper, were entirely absent in the opposition list.

It is entirely obvious that the case of the opposition was not as ponderous as presented in the matter of speaking for the industry.

What strength did the proponent forces show? This was at no time presented as a unit. There was no muster to see how strong they really were. But a check of those interests which took a definite stand at the hearings or who have otherwise definitely identified themselves as favorable to the cause shows that they represent in round numbers 2,000,000 tons of annual productive capacity in chemical pulp and 500,000 tons of groundwood pulp.

Employing conventional ratios for investment in pulp mill tonnage it may then be assumed that the visible proponent forces have some two and one-half billions

of dollars tied up in plant. Any consideration of these forces must carry in mind that this is only the strength that has so far been demonstrated. Some are still on the fence for one reason or another, but this undefined group includes substantial support that can be enlisted. Further, there will be a continued straddle of the issue in some quarters as long as international boundaries are straddled.

What is this visible strength in terms of the whole industry? The average annual production of wood pulp of all grades in the United States in the past half dozen years has been 4,500,000 tons. The average pulpwood consumption (including a million cords or more imported yearly) in the United States in the same period has been 7,000,000 cords.

The comparison is obvious. The proponents of protection are a very strong voice in the industry in terms of total investment, total production, and total number of jobs involved. On the latter point, in particular, it must be constantly borne in mind that, altho not shown in statistics of the industry, the pulp mills carry an auxiliary domestic payroll of great importance in the business of cutting and transporting the millions of cords of pulp wood needed annually.

The total strength is there. The proponents of protection have the right, if any group has the right, to speak for the industry. If they have not been able to make their voice heard it is because they have not spoken sufficiently in unison.

There are too many jobs involved in cutting wood, in fabricating wood into pulp, and in fabricating pulp into paper, to make it good business to let the industry keep on going out of the country; there is too much investment at stake in pulp mills, woods equipment and in timberlands to let this properly domestic business go over the hill without a struggle.

Unfortunately the national organization representing the industry has not given sufficient consideration to the wisdom of preserving the industry, all parts of it, to the United States. Perhaps it is reasonable to assume that the present serious defalcations within the industry are very largely attributable to that cause. An association with 50 and more years of history behind it has a valuable asset in name and tradition, an asset which should be preserved. No association, however, can hope to survive if it denies recognition to half the industry it presumes to represent.

Those who have investment in American wood pulp plants have never been in better position to demand that recognition. Those of the opposition who think will not wish to deny that recognition.

Unity, a program, and action.

THE ECONOMISTS ARE NOT SELLING

An interview with

RENO ODLIN, Assistant Vice President

First National Bank of Seattle, Metropolitan Branch

Extract from the hearings before the Ways and Means Committee, House of Representatives, Seventy-Second Congress, First Session, on "Equalization of Tariff Duties by Compensating for Depreciation of Foreign Currencies", Monday, May 16, 1932.

Mr. Vinson*—Did you read the statement of secretary of the treasury that the commodity values in the countries where currency had been debased would have a tendency to increase and that that would have a tendency toward equalization of conditions?

Mr. Odlin—I read that, but I also saw statistics that were very carefully prepared that seemed to me to prove rather conclusively that that is another one of those old economic laws that has not been working any more.

Mr. Vinson—Certainly the secretary of the treasury cannot be wrong, can he?

Mr. Odlin—I would rather not get into a discussion of that kind, but I think in this case it is a perfectly good economic law which is not working. The economists are not selling at the old high any more; they have not been for some time.

*Representative Fred M. Vinson of Kentucky.

IN AN airplane age horse-and-buggy reasoning is rather silly. But it is most surprising how the latter exists and persists. Technological development has been tremendous, but reasoning and the common barnyard type of intelligence have failed to keep pace. Today we are concentrating our thoughts—or believe we are—on jobs for men. The progress we make will not rest on superficial arguing of theories, but in a recognition of facts as they exist today. Today's conditions are the tangible things with which we have to deal.

When the domestic pulp producers—and that category includes every plant which has investment in plant for converting wood into pulp — found themselves squeezed by an intolerable and unfair foreign competition by reason of the depreciated currencies of some forty-odd foreign nations, an effort was made to secure some emergency relief by enacting legislation to equalize currencies. One of the Pacific Coast men who went to Washington, D. C., to testify was Reno Odlin, Seattle banker, an active man in civic affairs, and former state commander for the Department of Washington, American Legion. He does not pose as an economist. His argument dealt with the broad national problem of employment.

"One of the most difficult things we had to contend with," said Mr. Odlin after his return to Seattle following a stay of two months in the national capital, "was the

unreasonable adherence of the opposition to economics that remain as a heritage of the day when the horse was the motive power and oats the fuel. We were trying to present the case as it is today, the facts with which we now have to deal, but I'm a bit sorry to say that it was a most difficult task to shake the faith in grandfather's ideas.

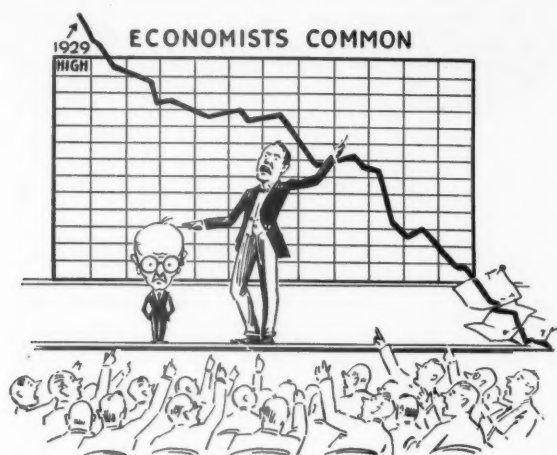
"For instance," Mr. Odlin pointed out, "we kept hearing this statement until we squirmed, 'when a nation goes off the gold standard, the commodity prices in that nation tend to rise and the effect is to force an early resumption of the gold standard, to the end that competitive conditions soon right themselves.'

"History can be cited on that one until your thumb wears out turning the pages, but what our friends, the opposition, forgot to consider, or at least to mention, was that that old saw holds good when you have one nation, or maybe two or three nations, off the gold standard. When that condition holds, the nations off the gold standard are isolated. What they export will provide them with a premium, but everything that they have to buy has to be bought at a stiff advance in price, because their own money is at a sharp discount in all other markets of the world.

"Now take the present instance. We have some forty nations which, if not actually off the gold standard, are operating with debased money, in terms of international exchange, so that the effect is the same. What happens in such an unprecedented instance? The few nations remaining on the gold standard, such as the United States, France, Germany, are left high and dry. The big trading area is now down where the bulk of the monies of the world are. The United States, for example, continue to demand gold dollars for the produce it exports, but any purchasing nations operating with a debased currency have to pay a stiff premium.

"Suppose an item of American manufacture sold for \$4.86. That is its value as related to gold, the world standard. This item, when sold to a British purchaser would bring one British Pound Sterling. Adjust ourselves now to the conditions of today. The Pound is quoted at this writing at \$3.61. In round figures this is a depreciation from the gold standard of 25%. Now when the Britisher comes to purchase this same item from the United States, he finds that he must pay, not

AT THE OLD HIGH ANY MORE



one Pound Sterling, but one and one-third Pounds, which in United States funds is \$6.48. The price is advanced 33%. This is, of course, too stiff an advance to pay and the natural consequence is that the Britisher will either restrict his purchases, or see if he cannot purchase under more favorable circumstances elsewhere.

"If it so happened that Britain were the only nation off the gold standard, then Britain would be required to pay one and one-third Pounds for this needed commodity, no matter where he placed the order. Everybody else would be on the gold standard.

"But it is at this point that our adhesive economists of the horse-and-buggy age fail to progress. They've never had a situation like it before, and they seem incapable of doing anything other than applying the old economic law of 'prices tend to rise,' applying it in the whole cloth without allowance for a change in conditions.

"What has happened now? Britain finds that there are forty nations off the gold standard with it, that the degree of depreciation of exchange for the group is quite comparable. Therefore it is not required to place its order with the United States and pay one and one-third Pounds. It can place the order with one of the other nations which is also off the gold standard. The condition we have now is one where the few nations remaining on the gold standard are the isolated ones and the general level of trade is 75% below the gold bar.

"That ought to make it plain that the United States stands to lose its export customers because its prices are now much too high for every one of these forty nations comprise just about the entire world of commercial consequence.

"We see then that our foreign trade is wiped out except for those items on which we hold more or less of a monopoly or at least a very decided advantage.

"On the import side, the United States, and the other few nations remaining on the gold standard, unless they set up protection of some sort during the emergency, are hit a blow below the belt. The Briton has an item for export which, in normal times, sold for \$4.86 in American funds. Stated otherwise, it brought him as pay-

ment one British Pound Sterling. Today, with the Pound quoted at a discount of 25%, the Briton still gets his American price of \$4.86, but it brings him one and one-third Pounds. If the price is quoted in Pounds the Briton still gets his same price of one Pound Sterling, but he lays the product down in the American market for \$3.61 and so far undersells his American competitor that the American folds up and tells his employees to go down and see what they can do in the bread line.

"The natural trend of events is that all these forty odd nations discover the lucrative American market at the same time where they can undersell the Americans without cutting their own prices, or where they can maintain American prices and get a fat premium in their own funds. Here is where their money is still on the same equivalent terms.

"What's the net result of all this primer school arithmetic? The forty odd nations flood us with cheap imports and cut our own factories out of business in the domestic market, and they get their supplies from each other and don't buy a nickel's worth here because goods cost too much in a gold standard market. Our imports increase. Our exports are entirely lost, except for those items on which we hold monopoly or extreme advantage. Those are the facts. The economists are still arguing theoretical conditions."

Mr. Odlin then turned to another phase of the subject which has clung in the maw of the economists and internationalists long after the flavor has gone out.

"We hear a lot about our foreign trade," said Mr. Odlin. "They insist on repeating that 'we mustn't do anything to hurt our foreign trade; nothing that would cause the other nations to retaliate.' That's an old mossy one that still has a lot of subscribers, but it is losing ground.

"As a matter of fact, our own Col. Greeley of the West Coast Lumbermen's Association, who gave an able argument at the hearings before the Ways and Means Committee of the House, informed the committee that data to show that a large percentage of the so-called 'retaliatory' preferential tariff system within the British Empire was started long before the enactment of the Smoot-Hawley bill. (Please turn the page)

"When we get down to cases, when we open our eyes, it is easy to discover that we have been repeatedly bluffed by this and that foreign nation. The 'retaliatory tariff' business is mostly just plain bunk. Do you suppose that any nation buys from us, or from any other nation, for love? This business world is a pretty cold one and no matter how much one may wish to theorize about it, the facts remain that goods are sold because the price, the terms, the quality, or the service is better; in short, because some material advantage accrues to the purchaser in placing the order where he does.

"We must look at facts as they are. If we could start all over, go back to the very beginning, wipe the slate clean and then commence foreign trade entirely anew, then I would believe in free trade, in the elimination of every barrier to commerce. But, can we do that? Our house is built. We have to live in it. We have this trade barrier and that restriction and our daily economic life is founded upon and interwoven with them. We have to work with the structure we have, poorly though it may be built. In common sense we must recognize facts, not eulogies in text books. To improve the structure is most commendable, but to tear all down radically that we may submit at once to even the most perfect theory is only suicide for the inhabitants."

A third relic of obsolete economics that Mr. Odlin encountered frequently in the hearings at Washington was the one about the insufficiency of American forests to supply the American demands for pulp and paper in entirety.

"To a resident of the Pacific Northwest," remarked Mr. Odlin, "this old one, founded upon an inaccurate survey of a quarter century ago, particularly rankled. We have a volume of excellent, and far more recent data which proves conclusively that nationally we have no dearth of domestic pulpwood supplies. In addition to the adequate forests of the Pacific Northwest we have tremendous stands in the South, as was capably brought out in the hearings by representatives for that region.

"This, 'dwindling forests' mouthing is just one other piece of evidence to prove that if the economists insist on adherence to obsolete data, opinions, and hearsay, they have only themselves to blame if they aren't selling at the old high any more."

Northwest is A-1, Says Duncan

Returning from a business trip of several weeks through the East, Alec C. Duncan, Portland manager of the Paper Makers Chemical Company, declares heartily that the Pacific Northwest is the best part of the country to live in in these times.

Mr. Duncan visited many pulp and paper mills in the eastern United States and Canada. Around Kalamazoo he found only two mills out of ten operating near capacity and the other eight running about 30%. The condition, he said, was general throughout the eastern United States and he estimates that the average mill is running about 50%. Here and there he found mills that were producing specialties working full capacity. Not only was curtailment prevalent in the east, but there were no indications of relief in sight.

Across the border the picture was somewhat different. The paper mills as well as the pulp mills appeared to be busy. "They weren't talking depression in Canada," said Mr. Duncan, "but they were talking business as usual." As a consequence of going off the gold standard and making some sacrifices, Great Britain, he said, appeared to be one nation that was coming back.

News Print Production—May, 1932

The News Print Service Bureau reports that production in Canada during May, 1932, amounted to 175,887 tons and shipments to 172,954 tons. Production in the United States was 88,087 tons and shipments 88,525 tons, making a total United States and Canadian news print production of 263,974 tons and shipments of 261,479 tons. During May, 24,627 tons of news print were made in Newfoundland and 1,005 tons in Mexico, so that the total North American production for the month amounted to 289,606 tons.

The Canadian mills produced 110,559 tons less in the first five months of 1932 than in the first five months of 1931, which was a decrease of 12%. The output in the United States was 31,973 tons or 6% less than for the first five months of 1931, in Newfoundland 6,744 tons or 6% less, and in Mexico 1,153 tons less, making a North American decrease of 150,429 tons or 10%.

Stocks of news print at Canadian mills totalled 37,014 tons at the end of May and at United States mills 35,156 tons, giving a combined total of 92,170 tons compared with 89,675 tons on April 30.

North American Production

		Canada	U. S.	Newfoundland	Mexico	Total
1932—May		175,887	88,087	24,627	1,005	289,606
Five Months		842,743	460,671	112,970	5,108	1,421,492
1931—Five Months		953,302	492,644	119,714	6,261	1,571,921
1930—Five Months		1,070,848	577,840	116,261	7,490	1,772,439
1929—Five Months		1,086,419	584,378	102,126	8,102	1,781,025
1928—Five Months		967,497	599,127	92,830	6,281	1,665,735
1927—Five Months		825,083	645,842	82,046	6,330	1,560,301
1926—Five Months		735,152	701,850	69,304	5,044	1,511,350
1925—Five Months		623,143	634,106	27,850	5,357	1,290,456

To Complete Survey

The Pacific Northwest Forest Experiment Station expects to finish late this year the field work of the Douglas fir region survey, which covers all the timber both private and public of western Oregon and western Washington. Providing Congress appropriates the necessary funds the survey is expected to be completed next year, according to the office of Thornton T. Munger, director of the experiment station.

The survey will reveal the amount of Sitka spruce and other pulp woods in the area, and their accessibility. The survey will disclose the area of each type of forest cover and the estimated stand by species. Volumes will be expressed in both board feet (Scribner rule) and cubic feet. Regrowth conditions on cutover and burned lands will be determined. Rate of depletion by cutting, fire, insects, disease and other factors will be revealed, as will also growth rates on old stands and on restocking areas and probable future yields. It will also discuss present national and local requirements in forest products and probable trends.

Horace J. Andrews is regional director of the survey, which is a part of a national survey.

William A. Kelly Honored

William A. Kelly, who resigned June 1 from the vice-presidency of the Hawley Pulp & Paper Company, was honored the evening of June 29 with a farewell banquet at the Multnomah Hotel, Portland. About 45 officials, department heads and employees of the Hawley plant and trade representatives attended. Ray Smythe presided as toastmaster.

Mr. Kelly, who was presented with a golf bag and carry-all bag, recounted his career to date in the pulp and paper industry. A number of brief talks, lauding Mr. Kelly, were made. The banquet committee consisted of Lionel Malley, purchasing agent; R. J. Schadt, technical engineer; E. A. Norton, electrical engineer, and R. W. Peters, treasurer.

Everett Mill Holds to Curtailment Program

Puget Sound Pulp and Timber Company, Everett, which has been curtailing since June 1st, is still indefinite as to output plans for the immediate future, states Ossian Anderson, president, as this issue of PACIFIC PULP & PAPER INDUSTRY goes to press.

While there is a possibility that the plant may operate some time in July, such operations would be on a definitely curtailed program.

Spaulding Trustees Appointed

Fentress Hill, J. C. Compton, E. Fred Emery, C. K. Spaulding, H. B. Van Duzer, McDannel Brown and Walter Woodin have been named trustees to hold for voting 51 per cent or more of the stock of the Spaulding Pulp & Paper Company, upon recommendation of the creditors' committee which reported June 28, after having had the affairs of the company surveyed and audited.

Recommendations of the committee included the issuance of \$350,000 of first mortgage six per cent bonds to be subscribed for by the stockholders to meet secured claims and by the unsecured claimants in exchange for their claims, by September 1, 1932. The trustees are to be authorized to issue one thousand shares of additional common stock of no par value to be used in whole or part as a bonus to purchasers of the bonds.

The plant was investigated by Stanley J. Eelden, consulting engineer of Tacoma, and T. C. Lovett, mechanical engineer of Portland, and the fiscal affairs were probed by Robinson, Nowell & Co., certified public accountants of San Francisco. They found that it would be impossible to operate the plant at present without a heavy loss, but that it had a proved earning power and "can be operated in competition with other pulp mills on this coast when more normal conditions are restored, provided it is managed efficiently and financed adequately, and provided certain additions and improvements are completed, which will bring its various units into balance and up to the full capacity of eighty tons a day."

In order to increase the capacity to eighty tons and insure a steady, uniform and economical production of pulp, a substantial amount of new money must be provided at some future time. Such expenditure at this time, however, it was found, would be useless.

It was found that as compared with pulp mills located at tidewater or on deep water the plant is at certain operating disadvantages arising from additional freight and handling costs on incoming shipments of fuel oil, sulphur and limestone, and on outgoing shipments of whatever part of its production moves by water. These disadvantages, however, were found to be offset in part at least by lower taxes and better labor conditions than are enjoyed by some competing plants, and possibly by lower wood costs. The net disadvantage was not considered serious enough to be the determining factor in the future success or failure of the plant.

The auditor found the investment in plant and other fixed assets at cost to be \$912,119.22, that there was no evidence of questionable accounting practice and that organization and managerial expenses had been held within reasonable bounds. Against assets in cash, pulp, etc. of \$21,511.52 as of April 1, 1932, the auditor found indebtednesses of \$275,805.70, including amounts due on sales contracts, taxes and interest, payroll, due to banks and other unsecured indebtedness and interest, making a net deficit of \$254,294.18.

Investigating Low Prices On Kraft Paper Imports

Promptly following the landing of a shipment of kraft paper from Finland recently the Import Committee of the American Paper Industry, with offices in New York, checked up to learn the reasons behind the very low prices. Mr. Warren W. Bullock, manager of the committee, gives the following information:

"We recently learned that an importation of ninety tons came in through the port of New York, for consumption in the Greater New York district, and that this is the first shipment of an order of several hundred tons which has been placed with the Finnish mills.

"The paper is No. 1 kraft, in medium weight, and according to reports in the trade was sold at \$3.60 per hundred pounds delivered. Customs permits do not permit the divulging of the declared values, but computing back to a mill price by deducting duty of 30% and ocean freight, indicates that the Finnish f.o.b. mill price of \$2.47, without making any allowance for commission, or importer's profits.

"This sale is possible at such a price chiefly because of the depreciation of the Finnish currency, which is greater than the amount of the duty to which the paper is subject. The importation is the first in many years from Finland, with the exception of scattering small shipments of hardly larger than sample lots.

"When information reached the Import Committee of the American Paper Industry of this shipment, steps were immediately taken to have government authorities make a formal investigation abroad of the dutiable value of the paper, and to determine whether sales are being made to United States customers at prices which would indicate dumping or undervaluation. Any further shipments, some of which are expected soon, will be denied liquidation pending the completion of the foreign investigation, and to secure the release of the merchandise the importer will be required to give bond to meet the payment of any additional duties that may be imposed if irregularities in the transaction are discovered."

Paper Containers for Can Empties are O. K.

The American Can Company, Portland plant, has been using kraft paper containers for tin cans now for about two years and is well satisfied with results. Formerly the cans were shipped to the packers in wooden crates. Now in the comparatively more delicate kraft paper containers they arrive in much better condition than they did in crates. There is a psychological reason for this. The freight handlers and truckers and warehouse employes don't expect the paper containers to withstand much abuse and so they handle them more carefully.

Two sizes of containers are used—24" by 24" by 30" and 19½" by 19½" by 28". A chipboard sheet forms the bottom of the container and a layer of chipboard is placed between each tier of cans.

Soviet Paper Production Lags

The output of the Soviet paper mills, despite constantly increasing production, still lags behind the provisions of the Five-Year Plan, which calls for a production of 501,800 metric tons of paper in 1930. The actual output was 470,000 tons. The Soviet press, which is directly interested, has recently expressed doubts that the planned production of 611,000 metric tons will be achieved during 1931, since in the first six months of the year only 240,000 tons were produced (as against 234,000 tons in the corresponding six months in 1930). It therefore appears extremely doubtful that the production of 900,000 tons will actually be reached.

THE WORLD'S MARKETS

in pulp and paper
at the beginning of 1932

A review by B. M. FROST

Paper Division, U. S. Department of Commerce

THE paper industry, in common with others, during the past three years has had to face the problem of adjusting itself to a world of shrinking markets, declining prices, and strained credits. Though these conditions did not manifest themselves as early in this as in other manufacturing lines, the rapid rise in consumption, which marked the early postwar years and which had encouraged manufacturers in a program of rapid expansion and mechanization of plant, came to an abrupt close.

Many Difficulties Encountered

The volume of paper consumption was not immediately affected, but advance orders were smaller and less numerous, and a hand-to-mouth buying policy set in during the latter part of 1929 and has continued up to now. This situation quickly resulted in an unusually heavy accumulation of stocks, which manufacturers made some effort to control by curtailing production. Their troubles were aggravated, however, by the fact that new machinery was constantly being installed and new production thrown upon the market. In this dilemma it was, perhaps, inevitable that price cutting should be resorted to, especially by mills not restrained by domestic associations or international agreements. These organizations attempted to check the downward trend in prices, but were forced to yield frequently to the increasing pressure. The situation was further complicated last autumn by the suspension of the gold standard in the United Kingdom, quickly followed by similar action in the Scandinavian countries, and later by a number of others. By the end of 1931 paper prices generally had fallen to a level lower than at any time during the past 10 years, and some further price concessions have been made since the first of the year.

Productive Capacity Exceeds Market Requirements

The present ills from which the industry is suffering are traceable to the failure of the anticipated increase in paper consumption, rather than to any sudden or drastic curtailment in the world's paper consumption,

although there has been, of course, some reduction therein. All of the leading paper-producing countries during the past decade have not only added to their plant and equipment—and incidentally their capital investment—but the mills in these countries have been engaged in a program of "rationalization," embracing the introduction of scientific management and mass production.

Between 1913 and 1927 the world's population was estimated to have increased only 10 per cent, while table No. 1, which shows the production of paper (inclusive of boards) in the leading manufacturing countries during the years 1913, 1920, and 1929, indicates an increase in paper production during that period of at least 100 per cent.

TABLE No. 1
Production of paper and boards in the leading producing countries
(Short tons)

Country—	1913	1920	1929
United States	5,270,000	6,278,500	11,140,200
Canada	318,900	1,215,100	3,197,100
Austria and Czechoslovakia ¹	285,400	330,200	614,700
Finland	349,700	202,900	679,800
France ²	462,000	500,000	923,900
Germany	2,162,700	1,484,800	2,799,300
Norway	241,600	273,700	447,100
Russia	424,000	40,800	506,600
Sweden	367,100	441,000	793,500
United Kingdom ²	1,167,500	1,357,000	1,598,600
Japan	147,900	369,700	709,100
Total	11,396,800	12,493,700	23,411,900

¹ 1913 figures include output of a few mills in Hungary and territory now part of Kingdom of Yugoslavia.

² Estimates.

Disruption in International Paper Market During 1930 and 1931

Meanwhile, the growth in the import trade has been arrested, owing to the ambition of a number of countries to become self-sufficient in their paper requirements.

Over the past two years the even flow of paper ship-

If you would like to tie in your own particular problems with that facing the world industry you will be interested in reading this review by Mr. Frost. The author goes into the subject quite thoroly and brings out many factors that go to explain why business is—or isn't—what it is.

ments to a number of the South American and far eastern markets has been further interrupted by political disturbances in those regions, as well as by the critical business situation following the decline in raw material prices.

Obviously, it is impossible at this time to present actual figures, or even reliable estimates, covering the world's paper production or consumption during 1931. That consumption of paper was somewhat less in that year than in either of the two preceding years seems evident, in view of the restricted business activities and the necessity for effecting economies in practically all countries. That consumption was greatly under productive capacity is evidenced by reports of partial or complete closing down of mills in all of the large producing countries, and the increasing percentage of unemployment in the industry registered in countries recording such data.

Mills turning out newsprint, wrapping papers, and boards appear to have suffered most, although manufacturers of writing and other fine papers complain of unremunerative prices and the difficulty of obtaining orders.

Table No. 2, showing exports of paper and boards from the leading exporting countries, does not indicate that there was a radical decline in paper consumption during the past two years, especially when it is borne in mind that a number of the large importing countries, including the United Kingdom, France, and Soviet Russia, have added to their productive capacity and are supplying the demands of their home markets to an ever-increasing extent. A comparison of values for the years mentioned, however, shows a much greater percentage of decrease, indicative of the general lowering in prices and the proportionately greater demand for the cheaper grades of paper during the past two years.

TABLE No. 2
Exports of paper and boards by leading exporting countries
(Short tons)

Country—	1929	1930	1931
United States ¹	262,700	242,200	234,200
Canada ²	2,515,500	2,331,000	2,008,200
Finland	326,400	337,900	357,000
Germany	527,600	470,900	514,500
Norway	364,300	341,700	330,700
Sweden	548,300	481,100	527,700
United Kingdom	282,600	238,400	181,400
Japan ³	92,900	112,500	93,500
Total	4,920,300	4,555,700	4,247,200

¹ Exclusive of wall and insulating boards, wall papers, and unspecified papers for which tonnage is not shown; amount given represents about 75 per cent of total value of paper exports.

² Newsprint only; represents upward of 95 per cent of value of total shipments of papers and board.

³ Does not include some classes for which quantity figures are not shown.

Similar Conditions in Wood-Pulp Market

Conditions in the international wood pulp market closely parallel those in the paper market. Thus, mill capacity in all of the great producing countries is greatly in excess of present market requirements, and plants in all countries have been closed down, or are running

on a part time basis, while current market prices do not allow a moderate profit.

Between the years 1920 and 1929, the aggregate capacity of the chemical pulp mills doubled, and that of the mechanical ground wood mills more than doubled. Even during the latter year, when paper production reached its peak, the Mechanical Wood Pulp Union, which comprised ground wood producers in Norway, Sweden, and Finland, found it advisable to curtail production by 33 1/3% in an effort to stabilize the market. This restriction was later increased to 38% and to 50% of mill capacity. Attention in all of these countries during recent years has centered largely on the production of unbleached sulphate (kraft) pulp, which is being substituted for unbleached sulphite in the manufacture of wrapping papers; and of bleached sulphite, which finds an outlet in the rayon industry and in the manufacture of fine papers.

Table No. 3 shows production by classes in these countries during the years 1913, 1920, and 1929. Chemical pulp mills during the last year mentioned operated close to capacity, but in the Scandinavian countries and Finland the restriction in ground wood production noted above was in force. (concluded on next page)

TABLE No. 3
Production of wood pulp in leading producing countries
(Short tons)

Country—	1913	1920	1929
Sulphite Pulp			
United States ¹	1,151,300	1,585,800	1,729,900
Canada	183,600	654,300	1,236,200
Austria and Czechoslovakia ²	214,100	141,100	520,600
Finland	88,100	121,200	518,400
Germany ³	925,300	437,400	1,211,600
Norway	280,000	284,700	418,900
Sweden	446,400	845,900	1,358,400
Japan ⁴	—	147,000	404,600
Total	3,288,800	4,217,400	7,398,600
Sulphate Pulp			
United States ¹	52,700	188,700	922,700
Canada	70,900	194,300	250,100
Finland	71,800	57,800	156,400
Germany	(⁵)	21,500	51,300
Norway	55,300	50,000	78,300
Sweden	171,300	225,500	716,400
Japan	—	—	29,300
Total	422,000	737,800	2,204,500
Mechanical Pulp			
United States ¹	1,293,700	1,583,900	1,649,000
Canada	600,200	1,090,000	2,420,800
Austria and Czechoslovakia ²	125,500	98,600	415,200
Finland	170,400	167,100	382,000
Germany	743,000	470,700	932,500
Norway	401,300	342,400	563,200
Sweden	359,500	358,000	725,600
Japan ⁴	85,800	133,000	290,400
Total	3,779,400	4,243,700	7,378,700

¹ Figures given for 1914, as those for year 1913 are not recorded by Bureau of the Census.

² Year 1913 includes output of mills in Hungary and territory now part of the Kingdom of Yugoslavia.

³ No distinction made between sulphate and sulphite pulp in 1913 figures; doubtful if any of the former was produced.

⁴ No distinction is made between chemical and mechanical pulp in 1913; total included under "mechanical."

⁵ See foot note ⁴.

⁶ Includes both mechanical and chemical pulp for year 1913.

Table No. 3 reflects clearly the trend in the paper industry toward the production of higher-grade papers, and also the growing importance of Canada in the world's pulp and paper trade.

Chemical pulp, which is employed in the manufacture of the more expensive papers, represented only 48.2 per cent of the total wood pulp output in 1913; by 1920, chemical pulp represented 53.8 per cent of the total output; and by 1929 the proportion had risen to 56.5 per cent.

Canada, which was outdistanced in 1913 by the United States and Germany as a producer of mechanical pulp, and by the United States, Germany, Sweden, Norway, and Austria-Hungary as a producer of chemical pulp, during this period has risen to first and third place, respectively.

Principal Markets for Wood Pulp

The principal destinations of wood pulp have been as shown in Table No. 4:

Country—	1929	1930	1931
Sulphite Pulp			
Canada	450,800	436,500	386,400
Finland	405,600	394,800	467,600
Germany	292,600	283,800	308,100
Norway	255,100	229,400	137,800
Sweden	1,008,300	1,006,300	859,100
Total	2,412,400	2,350,800	2,159,000
Sulphate Pulp			
Canada	134,300	86,100	55,100
Finland	128,100	129,600	226,200
Norway	28,500	37,600	16,000
Sweden	509,200	508,200	564,100
Total	800,100	761,500	861,400
Mechanical Pulp			
Canada	209,300	208,800	165,000
Finland	177,400	173,500	173,500
Norway	166,500	673,300	570,900
Sweden	369,100	290,800	249,800
Total	1,417,300	1,346,400	1,159,200

Price Declines Continue a Serious Factor

The weakness of the market has been accompanied by a more or less steady downward trend in prices. Canadian newsprint mills have announced successive decreases in the price of their product since 1929. As the situation in the international newsprint market is dependent upon the North American market, which absorbs about one-half of the world's newsprint production, European manufacturers — and particularly those in the Scandinavian countries and Finland — have found it necessary to make corresponding concessions in price. The downward trend in prices has also been true of the wood-pulp market.

Lack of Success of International Agreements in Maintaining Prices

An attempt to stem the downward trend in prices was made by the various cartels in the pulp and paper industries. Their efforts were hampered, however, by the fact that often important producers of a large section of the industry are not members and are not bound by agreements concerning restrictions in output or prices. The domestic organizations have been more successfully in achieving their aims, inasmuch as they have usually been able, through pressing for the enactment of tariff duties and other favorable legislation, to maintain prices in the domestic market and to assure it to the local industry. The problems confront-

ing the international cartels have been less easy of solution. Obviously, it is much more difficult to control production and prices in the international than in the domestic market, while the divergent interests of the various nations making up the membership are a constant threat to the existence of the organization.

The history of the Northern Mechanical Groundwood Union, is illustrative of the difficulties confronting the international cartel. This organization was formed in 1928 by leading mechanical groundwood producers in Finland, Norway, and Sweden, with a view to voluntarily restricting production and thus maintaining prices. It was only moderately successful in carrying out this program, owing to the fact that important producers in Norway and Sweden consistently refused to join the organization, and it was dissolved last April.

The suspension of the gold standard in a number of countries last autumn has also intensified the conflict in interests already mentioned. Countries adhering to the gold standard have found it difficult to compete in foreign markets, and often in their own market, with countries which have not maintained this standard. Thus, the depreciated currencies of the Scandinavian countries and Finland is rendering extremely problematical the future of the sulphite pulp suppliers, which also numbers among its membership mill in Germany, Austria, Czechoslovakia, and the Baltic succession states. German sulphite producers particularly are complaining of the difficulty of meeting Scandinavian competition, not only in foreign markets, but at home.

No Early Improvement in Market Observable

There has been little in the international situation since the first of the year to warrant any expectation of an early improvement in the world's pulp and paper markets. Any increase in the consumption of paper — and particularly newsprint, wrapping papers, and boards — is dependent upon a general pulp and paper stocks on hand at the end of 1930 have been reduced, and production in all of the important manufacturing countries continues greatly under capacity, producers have been unable to maintain prices in the face of the extreme reluctance of purchasers to commit themselves for more than immediate requirements. Exporters are further handicapped by the currency situation and by the increases in tariff duties, quota limitations, and other import restrictions resorted to by the various countries in an effort to protect their domestic industries, maintain currency values, or, in some instances to add to governmental revenues.

The Scandinavian countries have been able to maintain and even increase their pulp and paper exports during the first quarter of the current year, but only at a sacrifice in prices. Wood pulp exports from Canada during this period, on the other hand, have declined 20 per cent in quantity and 25 per cent in value. Those of newsprint have been maintained in better volume, but even here a decrease of 2½ per cent in quantity is accompanied by a decrease of 15 per cent in value. Exports from the United Kingdom during this period, perhaps, make the best showing, an increase of 6 per cent in volume being accompanied by a decrease of less than 1 per cent in value, while exports from the United States, which are nearly equal in volume to the first three months of last year, have decreased 28 per cent in value. Germany has been able to maintain its wood pulp shipments at about the same level as in 1931, but paper and board shipments have been less by about 10 per cent.

Gain Stopping-in-Transit Privilege

Paper mills in the vicinity of Portland have secured from the northern lines the stopping-in-transit-to-complete-loading privilege on carloads of paper and paper products for which they have been working for a considerable time. The new tariff supplement No. 3 to local freight tariff No. 63 of the North Pacific Coast Freight Bureau was issued June 17, effective July 21. It applies from connecting lines south and west of Portland over the Spokane, Portland & Seattle, Great Northern, Northern Pacific, Oregon, Washington Railroad & Navigation and Oregon Electric, and from stations on these lines, Portland, Oregon, to Vancouver, Wash. It permits of three stops to complete loading at a charge of \$6.30 per stop. Stops may be made at directly intermediate stations on the Oregon Electric or S. P. & S., at St. Helens, East Portland, Portland, North Portland or Vancouver.

Now the paper mill traffic managers are asking for a blanket stopping-in-transit privilege so that they can complete loading, at any directly intermediate points, of cars moving in any direction over any line, north, east or south.

In a further effort to meet truck competition on paper movements to eastern Oregon, eastern Washington and Idaho, the railroads propose to publish rates on lots of 5000 pounds that are slightly higher than the carload rates. The proposed rates are, Portland to Pendleton, 71 cents; to Walla Walla, 76½ cents; to Spokane, 97 cents, and to Lewiston, \$1.01½.

Canada's Pulp Exports Higher in May

Exports of wood pulp from Canada showed an increase in May as compared with the preceding month, but were below the shipments in the similar month last year, according to official figures issued by the Dominion Bureau of Statistics. Total exports of pulp of all kinds, mechanical and chemical, from Canada, in May, 1932, amounted to 34,963 net tons, valued at \$1,381,025, against 28,109 tons of a declared value of \$1,258,332 in April this year, 49,550 tons of a value of \$2,428,245 in May a year ago. Of the total in May, exports to the United States comprised 29,543 tons of a value of \$1,114,064, while shipments to the United Kingdom were 1,608 tons of a value of \$95,677, and exports to other countries were 3,807 tons of a value of \$171,284.

Exports of bleached sulphite from Canada in May amounted to 17,699 tons, valued at \$907,205, against 21,633 tons of a value of \$1,350,863 in the same month last year, while exports of unbleached sulphite were 6,382 tons of a value of \$207,673, against 12,049 tons of a value of \$507,005 a year ago. Exports of sulphate or kraft pulp were 1,338 tons, valued at \$61,932, compared with 4,271 tons of a value of \$268,903 in May last year, and screenings exports were 888 tons of a value of \$7,993, against 1,366 tons of a value of \$22,602 in May, 1931.

Finnish exports of pulp and paper for the four months ended April 30 are uniformly larger than during the corresponding period in 1931, the smallest increase being registered in shipments of mechanical groundwood, which show a rise from 44,201 metric tons to 44,273 metric tons. Exports of sulphite pulp, on the other hand, increased from 99,210 tons to 149,142 tons, a rise of nearly 50%, and exports of sulphate pulp increased from 47,028 tons to 68,335 tons, a rise of nearly 45%. Shipments of paper during this period rose from 83,787 tons to 90,535 tons and of pulpboards from 13,484 tons to 20,110 tons.

What's Used In Making Paper?

Although paper is one of the best known necessities of life and is something that enters into our life more often than any other one thing, the average person has no conception of what enters into the manufacture of that "scrap of paper" they so casually consigned to the waste basket.

The accompanying table indicates what a wide diversity of material is required in paper manufacture and how much of each substance.

This table gives the exact amount of each of the various materials which are used in the making of 100 pounds of paper.

Wood	13.4 cu. ft.
Sulphur	12.7 lbs.
Limestone	17.5 lbs.
Kerosene	5.07 oz.
Bleach powder	14.3 lbs.
Rosin	3 lbs.
Soda	515 lbs.
Alum	4.2 lbs.
Color	1.8 oz.
Coal or equivalent fuel	320 lbs.
Iron sulphate	79 oz.
Copper sulphate	19 oz.
Lime	3.17 oz.
Belts	2 sq. in.
Felts	32 sq. in.
Wire	67 cu. cm.
Lubricating oil	220 cu. cm.
Water, chemically purified and filtered	7,500 gal.

W. A. English Leaves Port Townsend

W. A. English, accountant at the Port Townsend kraft paper mill of the National Paper Products Company for the last three and one-half years, left June 17 with his family for Carthage, N. Y., to take up new duties as chief accountant for the company's mill in the eastern city.

Mr. English's place in the kraft mill will be taken by Jay N. Berg, who has been assistant storekeeper for the past two years.

Norway Imports Russian Pulpwood

Borregaard, big Norwegian pulp and paper company, in the report to shareholders covering the 1930 operations, said that large quantities of Russian pulpwood were imported because, altho domestic Norwegian wood prices had been reduced, the Russian wood was even cheaper.

It is reported that Borregaard imported in 1930 some 100,000 cubic meters of Russian pulpwood, valued at about 2,000,000 kronor.

E. Victor Donaldson heads the Robert Gair Company, Inc., organized under Delaware laws to take over the Robert Gair Company, a New York corporation. This is the third reorganization in 68 years. The company operates seven mills and converting plants and is a big factor in the nation's paperboard industry.

* * *

Walter D. Randall has resigned as vice-president of the Champion Coated Paper Company, Hamilton, Ohio, to pursue other interests. He is succeeded by his son, Herbert.

* * *

Kinberly Clark on June 16 reduced wages at two of its plants.

* * *

Report of the Wisconsin Tax Commission for 1930 shows a decline of 80% as against 1929 for the total net income of the paper industry in the state.

C · E · L · L · O · P · H · A · N · E

a wood pulp product
and a prodigy of wrapping materials

CELLOPHANE is now a household word. Yesterday it was an orphan crying on the doorstep for recognition. Today it is the infant prodigy in the field of wrapping materials. Now we are wrapping bon bons and buttons and beans, razor blades, smoked herring, clothing and forty thousand other items in it. What are some of the facts behind this recent phenomenon of the industrial, and particularly the chemical, world?

Transparent paper has been in increasing demand over the past ten years or more as a wrapper for candy, cakes and other food stuffs, toilet articles, tobacco products, automobile tires, delicately colored and expensive textiles, and other articles which deteriorate on being exposed to air, sun, moisture or handling. Waxed, glassine, and gelatine papers were originally employed for this purpose, but during recent years have had to yield place to transparent cellulose sheeting. These last three words, "transparent cellulose sheeting", are the impartial designation for what we now know commonly in the trade as "cellophane". However, it is a cumbersome description and although "cellophane" is a coined word, it is now rather strongly established and accepted by the public as the word for the product, even as the word "kodak" has in the United States come to be accepted as a term equivalent to camera, although it is a coined name.

In this article the word "cellophane" will be used to designate "transparent cellulose sheeting" simply as a matter of convenience.

Cellophane is rapidly usurping a place in the field of transparent, or semi-transparent, wrapping paper, although properly speaking cellophane is not a paper at all, but a compounded cellulose sheeting manufactured from a base of very high grade or "alpha" sulphite wood pulp, by a process similar to that used in the manufacture of viscose or acetate silk, more commonly known as Rayon or artificial silk.

Cellophane is the trade-marked product of the Societe La Cellophane of Bezons, France, and its subsidiaries. Cellophane was first developed in Taon-les-Vosges, by a chemist named E. Brandenberger, the original patents being the French company mentioned. This concern has patented its product in practically all countries where patent rights are available. Over the past several years the company has leased on a royalty basis, manufacturing rights to several other

concerns in European countries and to the DuPont Cellophane Company, Inc., in the United States. The latter firm has been almost the sole producer of this type of wrapping in this nation until in recent years, when another American firm, the Sylvania Industrial Corp., of Fredericksburg, Va., entered the field with a similar product. This was originally registered under the name of "Sylphrap", but is now styled "Nymphrap". The Sylvania Corporation is understood to be using the Belgium process of manufacture, which is very similar to the French.

In addition to these two companies, there are some ten or more firms in the United States manufacturing cellulose acetate. Sheets produced by this process, however, are understood to cost approximately twice as much as when the viscose process is used, and it has therefore not proved practicable in the manufacturing of wrappings.

There is no information at hand as to the volume of production of the several companies mentioned, and accurate data could only be secured by computing production statistics of the individual companies in the event these companies would be willing to volunteer such information.

Cellophane, to use a more common term, is manufactured at the present time in Czecho-Slovakia, France, Germany, United Kingdom, Belgium and Italy. A plant was recently established in Canada to care for that trade.

The interest of the wood pulp industry of course lies in the possible utilization of high grade wood pulp for this increasingly popular wrapping material. There is at the present time one Pacific Coast pulp plant bending practically its entire energy to the production of rayon-grade pulps. In addition there are two plants in the Eastern part of the North American continent, bending their major energies on similar pulp. There is also some production in the North European countries. It is somewhat a matter of pride for the Pacific Coast to record in passing that the Pacific Coast pulp has won a wonderful degree of acceptance in the world markets in a comparatively few years, a fact which has been due to close application to detail in the pulp manufacturing process.

Unlike the manufacturer of pulp and paper, the producer of pulp for cellophane—and Rayon—is lit-

the interested in preserving the fibre characteristics of the pulp, but concentrates on securing as high degree as possible of pure and uniform quality cellulose.

In the manufacture of cellophane, high grade bleached sulphite wood pulp is first treated with caustic soda, then with carbon bi-sulphide. Viscose, the product thus obtained, is completely soluble in water, and is an absolutely transparent fluid that can be compared to collodian.

It coagulates or solidifies very rapidly when brought into contact with certain salts or acids, hardening under such conditions almost instantaneously.

This viscose is a starting point for both artificial silk and cellophane. When artificial silk is desired, the viscose is forced through minute apertures not unlike the spinnerets of the silk worm, and the delicate threads thus formed are passed through a bath which coagulates them. In making cellophane, the viscose passes into a manifold and is forced through a slit-like aperture into a coagulation bath where it is solidified in the form of a sheet. Then it is treated to eliminate all foreign matter. Washing and drying completes the process and the final transparent product is a sheet approximately 35 to 38 inches wide, and from 0.001 to 0.005 inches thick, and of indeterminate length. It is completely transparent, strong, flexible, grease and oil proof and practically non-inflammable. It can be dyed, embossed, printed and fabricated in many ways. The earlier cellophanes were not waterproof, but new processes of manufacture now render it impervious to water. It can also be manufactured in any thickness and thus offers immense possibilities for the production of containers, boxes and similar items where qualities of strength and resistance to liquids are desired.

Although the nature of the general process in making cellophane is common knowledge, the actual mechanics of applying the process remain, with the several plants engaged, quite a closely guarded secret. Nor does there appear to be any common denominator of methods, all of which lead to the same end product. It might be said rather broadly that the technicians in the cellophane plant now know how to produce a very high grade article, but are still struggling in the depths to determine exactly how they do it.

In view of the close relations between the cellophane and Rayon industries, some mention of the latter would be in order in closing. The Rayon industry has attained a remarkable growth during its short existence of about two decades in the United States. Production has increased from approximately 320,000 pounds in 1911 to 123,000 in 1929, the peak year.

In the same year estimated production in other countries was as follows: Italy, 59,000,000 pounds; Great Britain, 53,100,000 lbs.; Germany, 45,000,000; France, 37,000,000; Netherlands, 20,000,000; Japan, 18,000,000; Belgium, 15,000,000; Switzerland, 12,250,000; other countries, 21,605,000 pounds, or a total of 404,155,000 pounds.

Rayon productive capacity is chiefly concentrated in the New England and Middle Atlantic, North Central, South Central and South Atlantic states.

As mentioned earlier, production statistics on cellophane are not available, and perhaps, even if available, would be entirely inaccurate due to the phenomenal increase of use of the material. It is difficult, if not impossible, to estimate the amount of wood pulp being absorbed in the cellophane industry. It is usually estimated that a ton of bleached sulphite pulp is required to make 1500 pounds of Rayon, which would entail a consumption of 136,900 short tons by the

world's Rayon industry in 1930 and 38,000 short tons by the industry in the United States, in the production of Rayon, and it is unlikely that the consumption of bleached sulphite pulp by the industry reaches the figure mentioned above.

A Comprehensive Book on Cellophane

TRANSPARENT FOLIEN

(Cellophan, Transparit, Heliozell, Ultraphan, etc.)

The manufacture, working-up, applications, etc., of transparent viscose, acetate, and gelatine foils, bottle caps, and similar articles. By Dr. M. Halama; 312 pages with 110 illustrations and 19 samples. Published in the German language by Chemisch-technischer Verlag Dr. Bodenbender, Berlin-Steglitz, Feuerbachstr. 6, 1932. Price RM. 18, bound in "cellophanized" gold foil with a "Transparit" dust cover.

In spite of its importance the comparatively young "cellophane" industry has not hitherto been comprehensively treated in book form. One of the aims of the present monograph is to fill this gap.

Following a review of the historical development of the cellophane industry, a detailed description is given of the various types such as regenerated cellulose hydrate, acetate and gelatine foils, also bottle capsules, so-called transparent wool, etc. The chief processes of production are then dealt with in detail.

The third chapter is devoted to the planning and equipping of a cellophane factory. A review of home and foreign patent literature is given in the succeeding chapter.

Other chapters deal with the various methods of improving the produce, namely, dyeing and printing, cutting, embossing, creping, making resistant to weather conditions, etc.

The numerous possibilities of application of cellophane are then dealt with in detail and illustrated by photographs. It is evident that this material, in similar fashion to rayon, has found very diverse uses, and is gradually gaining a footing in fields hitherto reserved for other materials.

The concluding chapter gives information concerning the producers in the different countries, their capital, dividends paid, products manufactured, etc., prices, and a list of trade names. Following the index are sixteen samples of various types of foil in different forms—colorless, smooth, dyed, printed, embossed, weather-proof, etc.

The book is a valuable addition to the literature in the chemical-technical field. It is a useful reference book to all engaged in the production and marketing of "cellophane" and as reliable and comprehensive source of information and instruction to all others who may be interested in any way in this new and progressive industry.

Japan's Paper Industry—May, 1932

	Production (lbs.)	Sales (lbs.)
Printing paper (high grade) ..	11,489,641	11,027,295
Printing paper	10,412,098	9,837,763
Drawing paper	2,221,668	2,045,606
Simili paper	8,537,241	6,190,692
Art paper	886,399	971,904
News paper	45,393,967	48,839,222
Sulphite paper	5,209,452	3,119,931
Coloured paper	1,504,755	1,449,263
Wrapping paper	13,053,849	10,951,683
Japanese paper	1,469,641	842,625
Board paper	6,561,458	5,476,250
Sundries	3,841,277	4,643,585
Total, all grades	110,581,446	105,395,819

BLISTERS—

Their occurrence in boiler tubes
and possible solutions to prevention

By THOMAS N. PARKS, Chief Engineer
Hawley Pulp & Paper Company

IT IS quite possible that some of our worthy friends here have at some time been confronted with the problem of finding a solution for blistered tubes in W. T. steam boilers.

The investigations and reasonings used, some of which I am familiar with, have in most cases, been far from scientific and in many cases the fault has been erroneously laid to causes that could not in any way be responsible.

It was just such a case that aroused my interest in bringing this subject before you. During the years 1930 and 1931 we experienced considerable trouble of this nature which took place on our 550 HP sterling boiler, which operates normally at 200% rating using 100% fuel oil with atomizing burners. Boiler pressure, 150 pounds per square inch, 100 degrees super-heat, fuel oil temperature prior to entering the burner, 150 degrees Fahrenheit.

The blistering of the tubes most always took place at the front row and approximately four feet above the bend of the tube entering the mud drum.

Various theories presented themselves as to the possible cause, since in any scientific investigation a theory must first be formulated and accepted or rejected, according to whether the findings support it or not. Theories openly discussed among engineers of sound practical experience, are as follows:

1. Soot accumulation. Oil prevented complete combustion and caused local super-heating of the tube.
2. Oil burners faulty, incorrectly adjusted, preventing even distribution of the heat.
3. Oil jets too close to tubes, resulting in impingement or local heating, causing excessive evaporation forcing the water away from the interior surface of the tubes.
4. Scale accumulation, particularly rear end bank with subsequent cause of restricted circulation.
5. Hot water returns, to hot well containing oil from steam engines and pumps.

In studying theory No. 3 at the initial stages of the trouble, this appeared upon the surface as the most logical cause, since the combustion space some what under the requirements for this type of boiler. Immedi-

ate steps were taken to correct this condition, by removing the burners from the front, to the back side. This work was carried out successfully, with the anticipation of relieving us of the trouble, but unfortunately we soon were to learn that very little had been accomplished in this respect.

Theory No. 5, tubes were examined for grease spots with negative results. This was to be expected, since, at the high temperature of the burn out, all oil or grease would naturally be volatilized.

In giving theories 1, 2 and 4, a thorough study, any possible cause of this nature was removed. The fact, however, that the tubes were cleaned internally and externally right to the metal, dispelled more or less the idea of local super-heating, due to any of these causes, for with the water which is in direct contact with the tube, super-heating is next to an impossibility.

The blistered tubes carried a large cone-shaped accumulation of iron oxide on the outside, approximately three times the diameter of the actual rupture. The blow-out invariably happened where the tube was reduced to an egg shell thickness, due to localization of heat.

In theory, it would seem that in considering internal scale accumulation, the iron is separated from the scale by a steam cushion which would perhaps act as an insulator of the heat, and at the point where the insulation is present, this part of the tube is over heated. It follows then, that in view of this reasoning, the conclusions mentioned, are logical.

The deposit was identified by our chief chemist, Mr. Ray Schadt, as black oxide of iron. At this point, the most logical theory was extensively entertained in the nature of the idea, that the soft, greenish deposit which was accumulating on the tubes and under the influence of the heat of the fire, was fusing and acting as a flux, thus causing corrosion and wasting of the tubes until they were reduced to a point where they could no longer withstand the pressure, resulting in an ultimate fracture or blow-out.

Further tests revealed the fact, that deposits composed entirely of ferrous sulphate (Fe SO_4) and ferric sulphate ($\text{Fe}_2 \text{SO}_4$) are soluble in water, resulting in an acid solution. When the boiler was in operation, the ferric and ferrous sulphates formed on the outer por-

This paper was presented at the Spring Meeting of the Pacific Section of TAPPI held at Portland, Oregon, May 6 and 7, 1932.

tion of the tubes, which finally fused under the influence of the high temperature to which the tubes were exposed. When in the liquid state, they gravitated to the under portion of the tube, where they became more under the influence of concentration and finally attacked the iron much the same as a flux, gradually weakening the tube to the rupturing point.

As mentioned in the preceding paragraph, oil jets were examined thoroughly, which proved that they were not responsible, and with such convincing evidence at hand, we agree that the blistering was caused by a corrosive action caused by the combustion and oxidation of the greenish deposit or sulphur, to sulphuric acid.

The first and most positive recommendation, is to reduce the sulphur in the fuel oil to a minimum and in this way, we believe that the prevention of the acid action will be assured.

Questions have been entertained, asking why is it, if the foregoing theory is to be taken for granted, that trouble is not encountered in the burning of coal, which as most of us know, carries a fair amount of sulphur. By careful analysis of conditions prevailing in the combustion of coal and oil, important differences are noted and are sufficient to allow the action to proceed in one case and not in the other, for the reason, sulphur is not present in coal in such large quantities as is found in oil.

Oil is almost organic in nature, coal quite the contrary. The organic matter carries a large amount of hydrogen, which, when burned, forms water; this water must be present, even tho it is converted into steam, before the sulphur contained in the fuel oil can form sulphuric acid.

Coal, an analysis shows, is mainly in-organic in its composition and contains less sulphur and hydrogen than does fuel oil. This is one of the main reasons that the trouble in question rarely occurs in coal fired boilers.

Experience has taught us that clean tubes corrode or blister more quickly than do tubes carrying heavy scale. With tubes absolutely free from scale, the water is in direct contact with the iron and is constantly conducting the heat from it, or in other words, the temperature difference between the water inside the tube to that exposed to the furnace temperature is only slight, even though the tube is exposed to the intense heat in the boiler furnace.

It is this very fact, that prevents the tube from burning. This low temperature is sufficiently low to condense the sulphuric acid being formed, and the acid condensed begins to attack the iron, ultimately forming sulphates of iron, and sooner or later such tubes affected will attain sufficient thickness, fuse and hastens the final rupture or blister.

Where internal corrosion is present in tubes the possibility of this action taking place is greatly reduced, for the scale in preventing the conduction of heat from the tube, allows it to become above the condensation temperature of the sulphuric acid, and for this reason it passes out through the first row of tubes without doing any material damage to the adjacent tubes.

As stated in the foregoing, sulphur content in the fuel oil should be held down to a minimum. Even 2% will invariably cause more or less trouble, especially if the tubes are free from scale and the flame from the burners is such, that it is in constant contact with the tubes. In over-coming this condition, we have attained reasonable success, by cutting peep holes in the front and side walls which enables the fireman to watch for this condition more closely and adjust the air accordingly.

Earnings of Pacific Mills Ltd. Declines

Pacific Mills Limited, Canadian company controlled by Crown Zellerbach Corporation, showed a reduction of earnings in the fiscal year ended April 30, 1932. President A. B. Martin, in the annual report to the shareholders, said:

"We have come through another trying year of world-wide depression adversely affecting all lines of business activity, and the paper industry has been no exception. It is gratifying to know, however, that notwithstanding these conditions, resulting in substantial declines of volume and prices, the position of your company, as disclosed in the accounts, has been maintained on a sound basis. Unfortunately, 1932 started in at a lower business level than 1931 with further substantial declines of volume and prices, and the outlook for earnings in the immediate future is not encouraging."

Operations for the year resulted in a net profit of \$215,904.23, after all charges for depreciation, depletion, bond interest and Dominion and Provincial income taxes. This compares with a net profit of \$413,515.79 for the year ended April 30, 1931. Preference stock dividends of \$119,934 were paid during the fiscal year, leaving a balance of \$95,970.23 added to earned surplus.

Current assets at April 30, 1932, amounted to \$3,660,811.87, and current liabilities, \$355,662.73, or net working capital of \$3,305,149.14, as compared with \$2,731,085.47 at April 30, 1931. Cash on hand amounted to \$1,024,532.72 at April 30, 1932 as compared with \$268,189.26 on hand April 30, 1931.

During the year \$200,000 first mortgage serial bonds were redeemed and purchases were made of \$128,200 of first and subordinated mortgage bonds as favorable market opportunities occurred, thereby reducing the total bonded indebtedness from \$3,867,200 to \$3,539,000.

Wells Grant, formerly with the Puget Sound Pulp & Timber Co., and for the past year studying at the University of Washington in the Department of Chemistry, has received a scholarship at the Paper Institute of Appleton, Wisconsin, where he will be studying next year, leaving here in September.

Swedish newsprint mills report a production of 21,805 metric tons (metric ton, 2,205 pounds) of paper during the month of April, as compared with 22,738 tons in the preceding month and 17,673 tons in the corresponding month last year.

Production of paper and chemical pulp by German mills during the month of April totaled 141,000 metric tons and 82,000 metric tons, both figures representing peak production for the current year. German mills are reported to be operating at only 50% to 60% normal.

The Japanese Paper Manufacturers' Association reports an output of 53,914 short tons and sales of 57,481 short tons of paper by the mills of the association during the month of March, bringing the total for the first three months of the current year up to 158,588 tons and 171,229 tons respectively. During the first three months of 1931 production totaled 164,787 and sales 169,785 tons.

The new plant of the Swedish company, Kopparbergs & Hofors Sagverks, is nearing completion. It will have a yearly capacity of 15,000 to 20,000 metric tons of sulphate pulp, which will be treated by a new bleaching process in use in the United States.

T · R · A · D · E • T · A · L · K

of those who sell paper in the western states

+ + + +

Announces Improved Folded Toilet Tissues

The National Paper Products Sales Company announces an improvement in the manufacture of Duo Fold and Twin Fold Folded Toilet Tissues which makes them extremely soft and absorbent.

The two tissues are used in public and semi-public buildings. Duo Fold is pure white and Twin Fold is natural in color. They are made on the Pacific Coast from clean, new materials—under hygienic conditions.

Duo Fold and Twin Fold are now packed 1,000 sheets to the package. This type of packing saves time in refilling the cabinets.

Duo Fold and Twin Fold Tissues can be had in three sizes to fit the standard types of folded tissue cabinets.

J. D. Kirby, assistant western sales manager of National Paper Products Sales Company, stated that these new improved tissues are the result of popular demand for softer and more absorbent folded tissues. He also mentioned that this improvement makes for greater economy.

The National Paper Products Sales Company also manufactures the nationally known No Waste Folded Toilet Tissue and Public Service Paper Towels.

Perfects Fir-Tex Decoration

C. E. Millington, son of and assistant to A. E. Millington, general manager of the Fir-Tex Insulating Board Company, St. Helens, Oregon, has developed a process for decorating Fir-Tex acoustical board. The new board has been on the market for several months and is said to be meeting with good acceptance, although sales are being retarded by economic conditions.

The decorating process consists simply of printing a one-color or two-color pattern on the board with high-grade, fast-color lithograph ink. The printing is done with a two-color cylinder press. The board is cut into tiles of various shapes and printed with any one or combination of a variety of designs just as a paper would be printed.

It is claimed that the lithograph ink does not in any way decrease or impair the accoustical or sound-absorption values of the board. Paint has been tried on various types of board and does reduce the accoustical value because it stops the pores. On the other hand, laboratory tests of Vern O. Knudsen, said to be one of the two leading consultants on accoustics, have shown that Fir-Tex decorated accoustical board has high sound-absorption values.

Glenn W. Cheney, in charge of the Fir-Tex department of Dant & Russell, exclusive distributors for the Fir-Tex production, sees a big future for this board through the education of business men to demand noise elimination in their offices. The board makes a highly attractive wall or ceiling as well as an effective sound deadener. A considerable market for it is developing in broadcasting rooms. Library and church installations have been made.

However, the greatest sale of Fir-Tex at the present time is for insulating purposes. It has been laid one-inch thick on the iron roof of a National Air Transport hangar at Port Newark, N. J. to keep out heat and in the ice arena at St. Paul in four-inch slabs. The Northern Pacific Railway is employing Fir-Tex in the construction of its 600 series of refrigerator cars at South Tacoma. On the floor and roof of the cars 2 $\frac{1}{4}$ inch thicknesses are being used, and on the sidewalls and ends 2 $\frac{1}{4}$ inch thicknesses are employed. The installation board at the car ends are being installed in one piece, about 8 feet by 9 feet in dimension. Mr. Cheney says the demand for the board for all kinds of refrigeration insulating purposes is increasing.

Forest Pulpwood Cut Increasing

In a report of the Pacific Northwest Experiment Station, the reported production of forest pulpwood (cordwood size), in the Pacific Northwest in 1930 was 256,150 cords; Oregon, 90,277 cords, and Washington, 165,873 cords. The total solid wood volume consumed in this form was 23,053,500 cubic feet. Western hemlock supplied about 50%, "white" fir 25%, Sitka spruce 17%, and black cottonwood 8%. A small amount of Douglas fir was also used.

Although statistics give no indication of the extent to which forest pulpwood has been used in this region in the past, it is evident that the 1930 production greatly exceeds that of previous years. Under present economic conditions, with many of the logging operations and sawmills closed down and others with greatly curtailed output, it is expected that the consumption of this form of material in 1931 will greatly exceed that of 1930.

There are two conditions suggesting an increased production of this class of material in the future; (1) each year logging operations are being pushed back to the less accessible timber in the more mountainous regions with a resulting increase in production and transportation costs, and (2) there are in the aggregate large quantities of available material that can be taken out in cordwood form at a relatively low cost, but which are too small or scattered to remove as sawlogs. Present pulpwood production is confined almost exclusively to timber of this character.

Sitka Spruce Best Coast Pulpwood

Sitka spruce is generally conceded to be the best pulping wood on the Pacific Coast. It compares very favorably with white spruce, the standard pulpwood of eastern North America. The average yield of pulp per cord of 100 cubic feet of solid wood, as determined by the Forest Products Laboratory is 2,100 pounds, bone-dry, by the mechanical process and 1,080 pounds, bone-dry, by the sulphite process.—From "Pulp Timber Resources of Southeastern Alaska."

Port Alice Mill Shut Down

Imposition of the new provincial tax on foreign fuel oil is given as one of the reasons for the shutdown of the Port Alice plant of the B. C. Pulp & Paper Company in mid-June. The Woodfibre mill was closed several weeks ago for extraordinary repairs and it is probable that both mills will remain idle during the summer.

"We operated as long as we could under existing economic conditions and the temporary suspension of operations was decided on only after careful consideration of the company's ultimate interests," explained President Lawrence W. Killam. "I hope that we will be able to resume activity early in the fall."

The tax on fuel oil, amounting to half a cent per gallon, is a severe drain on an industry requiring 500 barrels a day.

The company has also been adversely affected by fluctuations in exchange with countries in the Orient and the competition of Swedish mills.

About 265 men will be temporarily idle as a result.

Litigation On B. C. Timber Deal

Litigation respecting a big pulpwood deal on Graham Island, British Columbia, has recently been before the court of appeal at Victoria. Ronald P. Stockton, counsel for the Graham Island Timber Company, stated that the whole case was based on the assessment placed by the provincial government on the profit made from the sale of 500,000,000 feet of spruce and other timber sold by his company to the Powell River Company.

Mr. Stockton recalled that the Washington Pulp & Paper Company, operating a mill at Port Angeles, had bought the Graham Island timber from the Western Coal and Iron Corporation in 1923, through Michael Charles Lawlor, for \$240,000. The pulp company then formed the Graham Island Timber Company to which it sold 20,000 acres of timber for a total price of \$575,000, of which \$275,000 was payable in cash and the remainder in fully paid up shares of the Graham Island Timber Company.

Because of difficulties in towing the logs to Port Angeles the timber was sold to the Powell River Company in 1926 for \$610,500, less 10% commission, which meant that the Graham Island Timber Company realized about \$550,000 net.

"As our acquisition cost was \$575,000 and our selling price was \$550,000 there was an actual loss to the company and therefore could be no assessment," argued Mr. Stockton. "The provincial assessor, however, disregards the price paid by the Graham Island Timber Company and goes back and takes the price of \$240,000 paid by the Washington state company and assessed us on the basis of an income of \$188,689."

Mr. Stockton believed that the Washington company should be liable for taxation on the profit.

Eric Pepler, counsel for the government, said his position was that the Graham Island shares were not part of the cost of timber.

Decision has been reserved.

Exports of paper and paper products from the United States during the month of April were valued at \$1,464,793, a decrease of only about 1½% compared with the preceding month, but of 28% compared with April, 1931. Exports for the four months period ended April 30, 1932, reached a total value of only \$5,726,737 as compared with \$7,995,789 during the corresponding four months last year.

The Cellulose Industries In Japan

At an extraordinary session of the Japanese Imperial Diet the import tariff rates on pulp and paper of certain grades were materially boosted. A surtax of 35% has been imposed.

However, when it came to news print, the Japan News Paper Publishing Association prevailed upon the government to exempt news print. On this announcement the stock of the Oji Paper Company, largest news print producer in Japan, dropped two yen on the market.

The existing tariffs on wood pulp are boosted 35%. The pulp tariffs were opposed by the leading pulp and paper mill machinery importer on the ground that it would cause trouble for a great body of Japanese paper makers and that the increased price of paper would have a bad effect upon the cultural life of Japan.

The Shanghai and Manchurian troubles played an important part in cutting the Japanese exports of paper in the first quarter of 1932 to one fourth the volume in the same period in 1931. To the contrary, imports of paper into Japan increased some 48% in quantity and 37% in value. The prediction is, however, that the flurry is over and recovery has started.

The Japanese yen has been quoted at a heavy discount (40% or more) since the resumption of the gold embargo. The depreciation of Japanese exchange has interfered with sales of papers from Northern Europe as the mills in that region followed the British pound.

Domestic prices on paper have gone up since the gold embargo became effective, the increases amounting to as much as 40%, the average being about 30%. Even so, domestic papers are quoted at about 10% under imported grades, and the imports have therefore fallen off.

In the rayon industry there is some improvement. Exports of rayon yarns and textiles for the first four months of the year are well above the same period a year ago. Production is steadily climbing. It reached a new high in April, when output was 49,997 100-lb. cases.

Development of the rayon industry has increased the consumption of high grade wood pulps (silk pulp). In 1929 the consumption of this grade was 32 million pounds; in 1930 45 million pounds; and in 1931 64 million pounds. The Japanese company, Karafuto Kogyo, began the production of rayon-grade pulp in January. The mill has an annual capacity of 12,000 tons, and the grade is reported to be much improved lately.

The tariff has helped to improve prices and it is reported that a number of the leading Japanese paper companies are secretly considering the feasibility of entering the field.

The following mills are supplying silk pulp for the Japanese rayon industry Kipawa (Canada); A. B. Borregard (Norway); Saugburgsforengingen (Norway); Rainier Pulp & Paper Co. (U. S. A.); Kaukas Fabrik A. B. (Finland); Waldhof Zellstoff Fabrik (Germany). Reported prices are as low as \$50 per ton f.o.b. Kobe.

Transparent cellulose sheeting (cellophane) is now being manufactured in the United Kingdom by two firms, operating altogether four machines at present. It is understood that one of the companies is contemplating the installation of two more machines, which will be put into operation as soon as it is able to finance the project. While no authentic figures are available, it is estimated that consumption of this product during 1931 totaled 400,000 pounds. (Trade Commissioner Martin Kennedy, London.)

Permanent Record Papers From Purified Wood Fibers

Papers have been produced from highly purified wood fibers in the Bureau of Standards paper mill which exceeded the Federal government's strength requirements for bond and currency papers. This property, combined with the excellent stability of the papers under an accelerated aging test made by baking them, is further evidence that very permanent papers can be made from this type of fiber. The fibers studied, which are characterized by much greater purity and strength than the usual chemically-processed wood fibers, are a comparatively recent commercial development.

By studies of the fiber beating operation, which is a critical factor in the production of permanent record papers, a beating procedure was developed which permitted ready reproduction of the high strength, stability, opacity, and other properties desirable in this class of papers.

As this was one phase of the Bureau's research on the preservation of written and printed records, a study was included to the effect of variables in the usage of the sizing materials commonly added to secure the desired writing and printing qualities. Alum, an acid material, and rosin, which are added to the fibers before they are formed into paper, were found to decrease the stability of the papers unless the amounts used were very carefully controlled. On the contrary, starch when incorporated in the papers had no adverse effect on the stability. When starch or animal glue were used for surface sizing, the stability of the papers was improved.

Similar paper-making studies of the other fibrous raw materials used currently for record papers are in progress.

A more complete account of this work will be found in the November number of the Bureau of Standards Journal of Research.

Control of Relative Humidity In Small Spaces

In response to a demand for information about maintaining constant humidity in a small space, especially in a small cabinet in which some testing of paper can be done, an article by F. T. Carson, Bureau of Standards, has been published, which gives a brief description of suitable apparatus, together with a compilation of data for the preparation of solutions having the required relative vapor pressure.

Tables are given containing data for sulphuric acid solutions, glycerine solutions, and saturated solutions of certain salts.

In order to obtain a certain relative humidity one of the solutions is prepared having a relative vapor pressure corresponding to the desired relative humidity, and the air to be conditioned is washed with this solution or otherwise brought to vapor pressure equilibrium with it. Since the pressure of saturated water vapor changes rapidly with temperature change, resulting in a corresponding change in relative humidity for a given vapor pressure in the air, some form of temperature control is necessary. Several procedures are available, the choice depending upon the particular laboratory conditions and the accuracy required. The measurement of the relative humidity by means of a modified form of wet and dry-bulb psychrometer is briefly described.

Reprints of the article are available at the Bureau.

New Pulp and Paper Laboratory at Syracuse

A contract has been let for the construction of a \$50,000 pulp and paper laboratory building at the New York State College of Forestry at Syracuse.

European Pulpwood Prices Declining

"The European markets for pulpwood in general report declining consumption and weakening prices," Commercial Attache Marquard H. Lund reports from Oslo. "Quotations in most countries have reached a level which does not permit forest owners a satisfactory return on their investment. In some instances selling prices very little more than cover freight rates to the respective f. o. b. points. The three north European countries are in a somewhat better position, inasmuch as they are paying for their pulpwood in depreciated domestic currencies, and, in some cases at least, are selling their pulp and paper on a gold basis—which gives them a certain advantage in competition with other European countries that have not suspended gold payments.

"Germany, which normally imports about one-half of its pulpwood requirements, reduced its purchases from foreign sources in 1931 by about 35% as compared with the preceding year, and nearly 40% compared with 1929. At the same time the average price per ton dropped from approximately \$9.08 and \$9.03 per metric ton in 1929 and 1930 to \$7.47 per metric ton in 1931.

"Domestic sales of pulpwood are also slow, with prices between 40 and 50% of the basic schedules, which is approximately 20% less than a year ago. Consumption in Germany is considerably below normal, and buyers are exerting pressure for lower prices, in which they have not been very successful during the last month or so. It is possible, therefore, that present quotations represent the minimum.

"Even Soviet Russia is reported as refusing any further price concessions. Russia, in fact, has outdistanced both Finland and Poland as a source of German pulpwood supply during the past two years."

Windowless, Airtight Machine Room Satisfactory

The new buildings of the Blandin Paper Company in Minnesota, which are airtight and windowless, with automatic temperature regulation and a new type of lighting, permit papermaking under controlled conditions. News print production in this unique mill began last June, and after waiting to test operations under winter conditions in Minnesota, the company reports as follows:

"The complete control of ventilation, moisture, heat and light cannot be obtained in a building constructed along the old lines—full of windows and without the structural changes required in a building of such radical departure from the orthodox.

"Our experience up to date has been 100 per cent satisfactory. The machine room is free of fog and annoying moisture; uniformity of moisture content in the paper is easy to obtain; heat and light are satisfactorily maintained at a desired point at all times; and our employees appear to be well pleased with the new working conditions.

"We predict that this form of mill construction will be followed quite extensively in the future, when there is need for more mills, as, aside from the advantages named above, there is no further need of worrying about dirty or broken windows—quite an item in itself.

"We have had quite a number of distinguished visitors since the completion of the building, including many connected with the paper industry, and the general comment has been unanimously favorable.

"It is now past the experimental stage and can be accepted as a distinct improvement in paper mill construction."

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be careful — first, last, always

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The year is half over.
How is your SAFETY
record going to look
when you close the
books for 1932?

PULP AND PAPER MILLS IN THE STATE OF WASHINGTON
Statement of Accident Experience for May, 1932

Company—	* Hours Worked	Total Accidents	Frequency Rate	Days Lost	Severity Rate	Standing
Columbia River Paper Mills, Vancouver	45,147	0	0	0	0	1
Inland Empire Paper Co., Millwood	45,083	0	0	0	0	2
Fibreboard Products Inc., Sumner	23,059	0	0	0	0	3
Longview Fibre Co., Longview	93,625	1	10.7	7	.075	4
Greys Harbor Pulp & Paper Corp., Hoquiam	51,116	1	19.6	32	.626	5
Crown Willamette Paper Co., Camas	158,836	6	37.8	109	.686	6
Pacific Straw Paper & Board Co., Longview	25,508	1	39.2	9	.353	7
Everett Pulp & Paper Co., Everett	71,056	3	42.2	34	.478	8
National Paper Products Co., Port Townsend	61,969	3	48.4	36	.581	9
Puget Sound Pulp & Timber Co., Bellingham	27,424	2	72.9	22	.802	10
Rainier Pulp & Paper Co., Shelton	49,782	5	100.5	55	1.105	11
Washington Pulp & Paper Corp., Port Angeles	54,766	6	109.6	6048	110.433	12
Weyerhaeuser Timber Co., Longview	35,942	5	139.1	224	6.232	13

The following mills did not report—Puget Sound Pulp & Timber Co., Everett; Fibreboard Products Inc., Port Angeles; Pacific Coast Paper Mills, Bellingham.

The following mills not in operation: Tumwater Paper Mills; Everett Pulp & Paper Co. (West Tacoma plant); St. Regis Kraft Co.; Puget Sound Pulp & Timber Co., Anacortes; Shafer Box Co.

About Lord Beaverbrook

Pacific coast newsprint manufacturers are wondering what effect the recent activities of Lord Beaverbrook will have on their business.

Entry of Lord Beaverbrook into the eastern Canadian newsprint industry on a more active basis than formerly has given the situation an entirely new aspect, and the influence of the energetic British peer who rose from obscurity in New Brunswick to become one of the most important figures in the public and industrial life of Great Britain, may be far-reaching wherever newsprint is produced.

Lord Beaverbrook came to Canada some weeks ago to attempt a settlement of the financial difficulties confronting Brice Brothers & Company. He gave the bondholders and creditors an ultimatum, telling them that they would have to make large concessions, but that in return he would place substantial contracts with the company at the expiration of the current year. Although Beaverbrook has a large financial stake in Price Brothers through presentation of bonus stock from time to time, he said that his only interest in the rehabilitation of the company was his friendship with the late Sir William Price and sympathy for "the young Price boys."

An important development at the Price Brothers meeting, at which Beaverbrook had sufficient proxies to force his program, was Beaverbrook's statement that he would continue to operate Price Brothers as an independent unit in the industry. "I have no intention of entering into any amalgamation," he announced.

Beaverbrook now has a tremendous power in the industry. If other operators do not fall in line with his plans and policies, he has in Price Brothers the weapon to force them. Further, if the other companies resist, the resulting struggle may prove disastrous to present bondholders, who have already seen heavy depreciation in their investments as a result of previous struggles.

Well authenticated reports indicate that Beaverbrook's policies are in conflict with those of the committee of bankers headed by E. W. Beatty, president of the Canadian Pacific Railway, which has been investigating conditions in the industry with a view to bringing about stability through amalgamations.

This is regarded in Canadian financial circles as somewhat unfortunate inasmuch as the committee has been working in harmony with the different manufacturers with a view to keeping the companies out of bankruptcy and protecting the interests of the security holders. That the committee has been on good terms with the industry was indicated recently when Premier R. B. Bennett announced a few days ago that the Dominion government might shortly undertake extensive financial assistance for newsprint producers, thus giving official support to the negotiations now in progress.

Beaverbrook conferred with A. R. Graustein, head of International Paper, and it is reported that the Britisher received little encouragement. There is a story to the effect that Graustein presented Beaverbrook with a basket of flowers during his stay and that Beaverbrook's note of thanks was so phrased as to be regarded as a definite warning to International and all other companies that might oppose his plans.

Beaverbrook has gone back to England but is reported to be returning to Canada in a few days. He may have changed his mind by then, but meanwhile newsprint executives on both coasts are wondering how far he will get with his plans for putting the industry on its feet again.

Meanwhile a section of those in touch with the situation are wondering how it happened that one who is reported to have no actual cash invested in Price Brothers is given such a degree of power that by following out a certain line of action he could throw the industry into confusion. On the other hand, with co-operation of the various interests concerned, such power could be used constructively for rehabilitation of the business.

"At present two things stand out," remarks The Financial Post of Toronto, one of the leading authorities on the newsprint situation in Canada, "Beaverbrook must be regarded as a strong, if not dominant, factor in the Canadian newsprint industry, and secondly, that for the time being, and possibly permanently, the Beatty newsprint committee is like an engine with the fires drowned."

Mr. Beatty recently issued a significant statement in which he said that co-operation and consolidation were essential. "Indeed," he said, "it is plainly a choice between consolidations and chaos, and in consequence, ability of the companies to operate effectively and efficiently in the interests of their security holders and owners."

B. C. Industry Recommends

The British Columbia pulp industry is making several important recommendations to the British Empire Economic Conference being held this month in Ottawa. They are aimed at the expansion of the British market for pulp produced on this coast.

Twenty percent preference in Empire markets and action to equalize the currency within the Empire have been advanced as a method of offsetting the losses suffered in other markets due to erratic exchange, tariff restrictions and decline in demand.

If a preference were granted, British Columbia pulp could find an outlet in several Empire countries that now place their orders elsewhere, it is contended. India has large annual requirements of pulp and if the present effect of monetary exchange could be counteracted British Columbia could win a share of the business to be had there.

Development of pulp shipments from British Columbia to the United Kingdom by way of the Panama Canal has been suggested as a probable result of establishment of a tariff preference. The Eastern Canadian pulp mills, being busy with the eastern United States market, have not concerned themselves much with the United Kingdom.

British Columbia mills have turned to the Far East for a good deal of their export pulp trade, being unable to compete in the United Kingdom with Swedish pulp. These Far Eastern markets have declined as a result of exchange fluctuations and political and economic uncertainties so that manufacturers are eager to find another more dependable place in which to sell.

Bounty Restored

British Columbia shippers of newsprint and pulp to the Orient had good news the other day when it was announced that the Canadian government had decided to resume its subsidy on cargoes between Pacific Coast ports and China. This subsidy, which had resulted in encouraging trans-Pacific trade in lumber as well as pulp and paper since 1930, was suspended last spring when parliament failed to grant the appropriation. A delegation of coast business men went to Ottawa and succeeded in having the bounty restored. It amounts to about \$7,900 a cargo.

EQUIPMENT + SERVICES + SUPPLIES

announcements of the auxiliary industries

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Many Mills Order Jones Equipment

The E. D. Jones & Sons Company, Pittsfield, Mass., has recently closed a contract with the Minnesota & Ontario Paper Company for four large Jones jordanans. In addition to this contract the Jones company has recently received orders for their jordanans from the following mills: Rondout Paper Mills, Sanitary Paper Mills, Inc., Ponds Extract Company, Hinsdale Paper Company, Martin Pulp & Paper Company, Sterilek Co., Inc., (Capron) Utica plant, Superfine Paper Mills, Inc. (Clayville plant), Rogers Paper Mfg. Co., and the Diamond Mills Paper Company.

Orders for six new large type Jones screens have been received from the Union Bag & Paper Corp., and the Beckett Paper Co.

Recent orders also show a greatly increased demand for Jones bandless plugs, along with a good repair business, especially for beating, and jordan engine equipment.

The Jones company feels that this increased activity in the paper equipment line might be an indicator of the return to business prosperity which has long been looked for as the mills are now placing themselves in a position to take full opportunity of the return of better business conditions.

New Gear-Motors Announced by General Electric

A line of gear-motors, readily adaptable for application to machinery of widely various designs, has been announced by the General Electric Company. The underlying principle of these gear-motors consists of a normal speed motor in combination with a built-in, internal-helical planetary-gear speed-reducer. Since this type of construction permits a wide choice of speeds on the output shaft, it is possible to adapt a gear-motor to almost every type of low-speed drive. Compact construction, high efficiency, full horsepower rating of the motor at the output shaft, economy of installation and operation because of the self-contained unit, and simple design are some of the many features of these gear-motors, which are available in either flanged or vertical mountings.

The General Electric Company also offers gear-motors with special electrical characteristics, such as high starting torque with low starting current, normal starting torque with low starting current, adjustable, varying speed, multispeed, etc., or mechanical features such as totally enclosed; totally enclosed, fan-cooled; or Class I, Group D, construction for use in hazardous gas locations.

New Skids and Trucks

The Elwell-Parker Electric Company, manufacturers of electric industrial tractors and trucks, Cleveland, Ohio, are offering a new materials handling system and devices. The major feature of this system is a special type of skid with a very small floor clearance, which, in some industries, is finding favor over the older and so-called "standard" skids. An added feature of this is the new telescoping uprights on power trucks which enables the operator to stack materials to heights far greater than has been possible up to this time.

Hypoid Dryer Gears by Black-Clawson

The Black-Clawson Company of Hamilton, Ohio, has had its engineering department working out some new ideas during the "quiet" times, and now announces the hypoid dryer gear.

The new gear does away with the conventional spur gear. The company states that through the use of hypoid gears an arrangement has been perfected that seems to have advantages over any other dryer gear so far attempted. The gears are spiral bevel in design, and are so constructed that the pinion is carried off the horizontal center line of the large gear, thereby permitting the pinion shaft to pass the shaft of the larger gear.

Briefly, each dryer is driven by a pair of hypoid gears similar to the gears that are used on a drive stand except that they are of smaller size. The pinion gear, being off center of the large gear, permits the use of a shaft along the machine connecting either the top row of dryers or the bottom row.

An obvious advantage is the possibility of spacing the top and bottom row of dryers farther apart, making for better ventilation and easier handling of the sheet after a break in the sheet has occurred.

The dryer journal is equipped with Timken bearings and the housing supporting these bearings is integral with the gear casing.

The gear casing completely encloses the gears in an oil-tight chamber. The oil in the reservoir is maintained at a level high enough to assist in the lubrication of the Timken bearings that support the cross shaft as well as to provide ample lubricant for the gears themselves.

New E. D. Jones Valve Bulletin

A new, eight page bulletin, featuring the Reed Stock Valve, now manufactured solely by E. D. Jones & Sons Company, Pittsfield, Mass.—and also their Beater Valves: Oblong and Round, Emptying, Water Device, Hydrant, Combination wash-up, Quick-opening, and Globe and Angle valves—has just been issued.

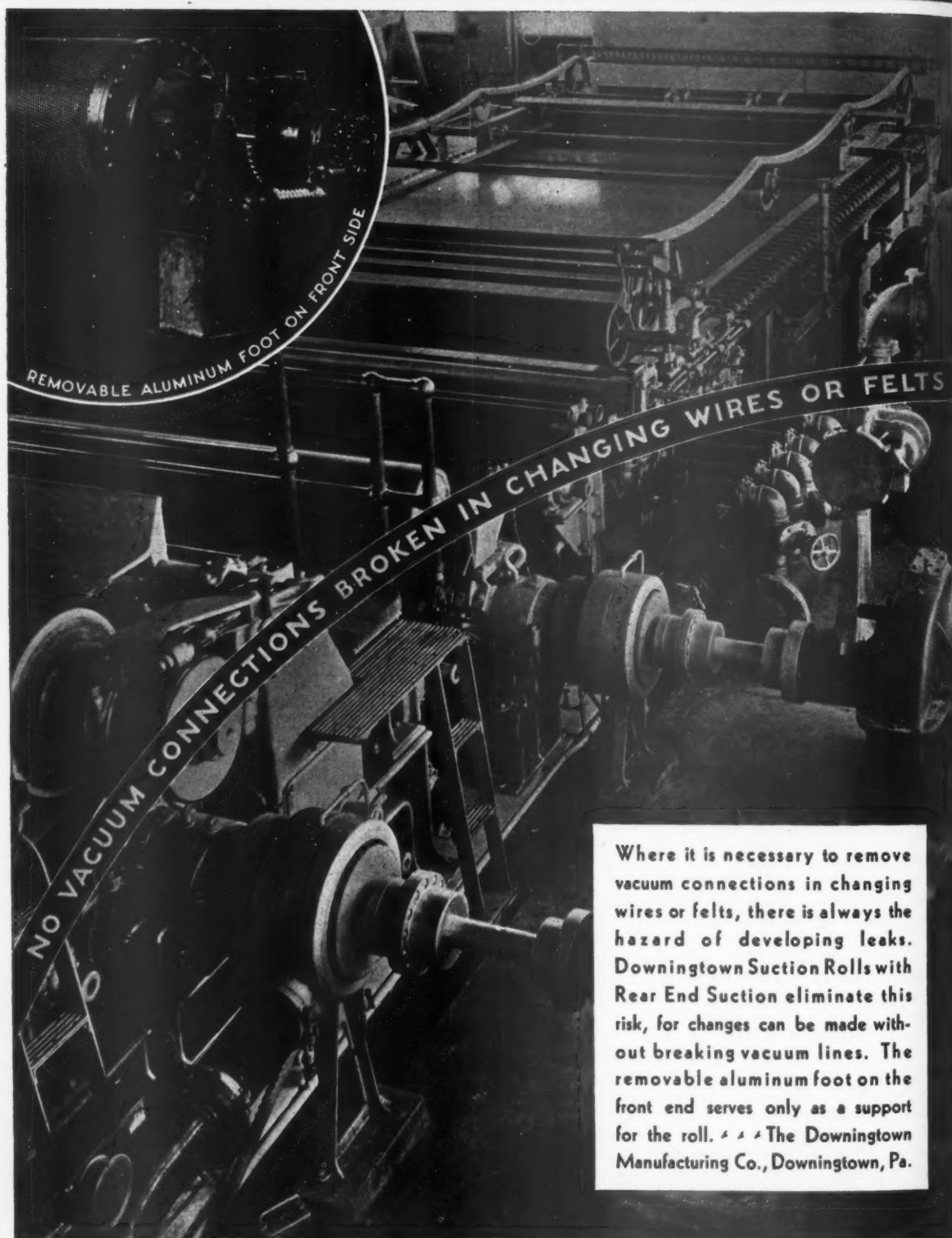
It is profusely illustrated, and clearly describes the design and operation of each type valve.

A chart listing the weights, volumes, etc., of liquid pulp stock carrying various percentages of air dry stock, and also a chart showing loss in pressure due to friction in smooth pipe—consistency % of air dry stock—friction loss in lbs. per square inch 100-in. pipe—offers valuable information to mill men interested in valve performance.

A copy of this bulletin will be mailed, upon request to the E. D. Jones & Sons Company, to any mill executive interested in receiving it.

Fred Sievers, superintendent, and John N. Findlay, sales manager for Vancouver Island, acted as hosts and guides for members of the Victoria Junior Chamber of Commerce when they recently inspected the plant of the Sidney Roofing & Paper Company, Victoria.

DOWNTOWN



REMOVABLE ALUMINUM FOOT ON FRONT SIDE

NO VACUUM CONNECTIONS BROKEN IN CHANGING WIRES OR FELTS

Where it is necessary to remove vacuum connections in changing wires or felts, there is always the hazard of developing leaks. Downtown Suction Rolls with Rear End Suction eliminate this risk, for changes can be made without breaking vacuum lines. The removable aluminum foot on the front end serves only as a support for the roll. ▲ ▲ ▲ The Downtown Manufacturing Co., Downtown, Pa.

When writing DOWNTOWN MFG. CO. please mention PACIFIC PULP AND PAPER INDUSTRY

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Mulberry Trees As Pulp Wood

Japan can produce paper to the value of about Yen 200,000,000 a year from the mulberry tree, and add greatly to the wealth of the country, according to Dr. Sojiro Kawase, doctor of agriculture, of the Agriculture Department of the Imperial University of Tokyo, who has just succeeded in the attempt to make mulberry paper of a fine quality.

Japanese paper is mostly made of kozo, or what is called the paper mulberry tree, of which production is not large, the ordinary tree being used as fuel after its leaves are taken as food for silkworms.

Some time ago a method of producing paper from the bark of the ordinary mulberry tree on a commercial basis was discovered in Aichi Prefecture, and some concerns started the manufacture of mulberry paper, using the new method.

Going a step further, Dr. Kawase has invented a method for producing paper, making the whole of the mulberry tree, including the trunks, twigs and the barm, into pulp. The paper thus produced is said to have strong tissues and to be well suited for use in envelopes, wall paper, and silkworm egg sheets. With some improvement Dr. Kawase thinks that he can make the paper into an excellent substitute for esparto, foreign printing paper of the best quality.

About 1,720,000 tons of mulberry wood are produced in Japan in a year. The production of "foreign paper" amounts to Yen 15,000,000 a year, and when mulberry is used for the production of this type of paper the total output will exceed Yen 200,000,000 it is believed. This would be sufficient to satisfy the demand for "foreign paper" and would leave a good margin for export. Even if one-third of the annual production of the mulberry tree were used for the manufacture of paper, its commercial value would be very great, it is pointed out.

The production of the mulberry tree is larger than the output of Karafuto's pulp wood for paper, which is about 1,000,000 tons a year. While the trees planted for pulp wood are not available for use for about 30 years, the production of the mulberry tree is inexhaustible and the same amount can be obtained every year.

When the manufacture of paper from the mulberry tree is started on a large scale it will revolutionize the paper industry of this country, it is believed, and the situation will come as a great relief to the farmers who are cultivating the plant.

Pacific Coast Pulp In European Markets

The rapid increase in the production of wood pulp in the Pacific Coast region of North America, and the strategic position of the mills in that territory for feeding the export market has resulted in an inevitable influence in pulp markets of the world. In the past two or three years some considerable tonnage of Pacific Coast sulphite pulps have been moving into European paper mills.

As to the effect of this movement into foreign markets it is learned from Becker & Co. (1924) Ltd., a London importing house, that "it is very difficult at the moment to state definitely what influence the new Pacific Coast development has on the market in this country. You are probably aware of the depressed state of all trades today, and the consequence is that as far as cellulose is concerned, the output from the European producing countries has been by agreement reduced to the extent of 33%.

"In normal times we are certainly of the opinion

that there is a great future for the Pacific pulp on this market, providing competition can be maintained as against European sources of supply.

"As far as the quality is concerned, this is in every way satisfactory. The only difficult factor which might occur is one of delivery, for as you know, pulp from the Pacific Coast takes anything from 6 to 8 weeks, and possibly longer, to arrive here, and in the case of urgent demand, the European producers would get the preference. However, in the case of contracts, once the continuity of supply is established, there should be no difficulty from the point of delivery."

Japan To Limit Pulp-Paper Imports

The present Japanese government is instituting a five year plan to prevent imports and to increase exports.

The following official notation has been made in this connection as regards woodpulp and paper.

"Pulp for Paper Making: Imported annually to the amount of Yen 12,000,000.

Plan: To increase the output in Japan by 50%.

Import Tariff: It is unnecessary to revise the tariff.

Measures to be Taken: It is not so hard to produce sufficient pulp for paper and rayon making to cover the entire demand, but it is thought wise to increase the present output by only 50% as the production of a greater amount will give an ill effect to forestry until a national policy for domestic reafforestation is firmly established.

Paper: Imported annually to the value of Yen 9,973,000.

Plan: To produce 70% of the local requirements.

Measures to be Taken: It is needless to import printing, packing and match paper, and the imports may be prevented if the Government uses discretion. The recent invention of making paper from mulberries will facilitate the attempt."

It is quite probable that Japan will continue a high tariff policy. The paper and pulp trade, however, is in a slightly more favorable position than other industries and so the Pacific Coast should still continue to benefit. Conditions hinge at present on the Japanese-Chinese situation which is forcing down the Yen and naturally putting imported pulp at a disadvantage. So far Japanese producers have not raised their pulp prices more than 15% whilst exchange has depreciated by over 25%.

Finn Develops New Sulphite Cooking Method

A new method for the manufacture of chemical pulp in Finland has been patented by Engineer Karl Yrjö, Kylander, Helsingfors. He claims that according to his method the cooking may be carried out at higher temperatures than by present methods used, which considerably shortens the time needed for the cooking process without injuring the quality of the pulp. Temperatures ranging from 150° to 170° C are employed in the manufacture of sulphite pulp and between 190° to 200° in the manufacture of sulphate of soda pulp. A preliminary treatment of the pulpwood is necessary to insure against obtaining a "black cook" at these high temperatures. This preliminary treatment of the wood also shortens the cooking period by two to three hours, if the Ritter-Kellner method is used, and three to five hours if the Mitscherlich process is employed. Output of cellulose varies from 48 to 52% and the loss of fibers with the waste liquor is very small. According to a statement by the inventor, mill trials have been carried out with satisfactory results. (Commercial Attache Marquard H. Lund, Oslo.)

Willard P. Hawley, pioneer paper manufacturer who died at his Portland home December 1, 1931, left an estate appraised at \$376,986.38, including \$88,036.03 cash, according to an inventory filed recently in circuit court.

Alloy Cast Irons for the Paper Industry

Abstract of a paper, "Developments in Alloy Cast Iron for the Paper Industry," delivered before the Technical Association of the Pulp and Paper Industry in New York.

The tax upon the income of the paper mill, represented in the annual bill caused by damage from corrosion and the expense of replacing, renewing, re-grinding, repolishing and refinishing the worn or broken parts of cast iron used up in the heavy, speedily moving machinery, can be significantly lessened by taking advantage of progress which has been made in alloying cast iron.

Corrosion in acids, caustic, wash water and white water, etc., can be appreciably retarded by using improved compositions of cast iron containing nickel, copper and chromium, in the pipes, pumps, parts, fittings, etc., which handle these corrosives. Properly balanced compositions of cast iron for the dryer heads, rolls and calendars offer relief from the troubles attending wear, cracking and breakage.

Engineers of the pulp and paper industry have in their power the means of bringing about sizeable ultimate economies in maintenance by carefully selecting and purchasing cast irons properly fitted to do each particular operation. The basic properties of cast iron,

namely easy castability, machinability, etc., and its procurability from sources familiar with its production and application, make the improved cast iron products readily available and easy to apply.

The Materials and Construction Committee of the T. A. P. P. I. will continue to play an important part in the future in bringing up to date information upon the progress that is being made in alloying cast iron which is so extensively used in paper mill equipment.

German Mills Reorganized

The German mills formerly controlled by the British Combined Pulp and Paper Mills, Limited, have now been organized as Holding-Gesellschaft für Zellulose und Papierfabriken A. G., according to a paragraph appearing in the "World's Paper Trade Review" (London). The company, which is capitalized at approximately \$1,293,000, is controlled from the Schweizerische Treuhand Gesellschaft in Zurich, Switzerland.

The mills included in the new company are: The Silesian Pulp and Paper Mills, the East Prussian Paper and Pulp Works, the Koeslin Paper Mill, the parchment mills of R. Rube and Company, and some others. The expansion of the company's interests was considered at an extraordinary general meeting.

IMPORTS OF PULP WOOD AND WOOD PULP INTO THE UNITED STATES
BY COUNTRIES AND CUSTOMS DISTRICTS

APRIL, 1932

Compiled by the U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce
(Figures Subject to Revision.)

	PULP WOOD								WOOD PULP							
	Rough				Peeled				Mechanically Unbleached				Ground Bleached			
	Spruce Cords	Dollars	Other Cords	Dollars	Spruce Cords	Dollars	Other Cords	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
Countries—																
Canada	994	7,490			11,591	101,450	6,289	37,222	266	3,109						
Total	994	7,490			11,591	101,450	6,289	37,222	266	3,109						
Total Imports of Pulpwood, April, 1932—19,140 cords; \$149,271.																
	PULP WOOD								WOOD PULP							
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	Rough				Peeled				Mechanically Unbleached				Ground Bleached			
	Spruce Cords	Dollars	Other Cords	Dollars	Spruce Cords	Dollars	Other Cords	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
Countries—																
Canada	994	7,490			11,591	101,450	6,289	37,222	266	3,109						
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Countries—																
Canada	994	7,490			11,59											

Herty Shows Southern Wood White Papers

Will the news print industry, which has trekked north for the last twenty years, pick up and go south within the next decade? That is one question that is raised by the announcement of Dr. Charles H. Herty, industrial consultant of New York, that white papers may be made successfully from the longleaf and loblolly pines, which species comprise the great bulk of the Southern woods.

Dr. Herty has been carrying on experiments for some time in his capacity as head of research at the institute maintained by the Georgia Department of Forestry and Geological Development. An ardent believer in the ability of the United States to meet its entire pulp and paper requirements. Dr. Herty has worked with the Southern species with confidence that white papers and news print could be made therefrom.

At a meeting of the Georgia Forestry Association in June Dr. Herty displayed for the first time samples of white paper. The potential pulpwood timber reservoir made available by the research includes 100 million acres of longleaf and loblolly pines constituting the bulk of the Southern forests extending through Virginia, North Carolina, Georgia, Florida, Mississippi, Alabama, Louisiana, Arkansas, Missouri, Tennessee, Texas and Oklahoma.

Mayhew On Commission of Inquiry

R. W. Mayhew, managing director of Sidney Roofing & Paper Company, Victoria, B. C., has been appointed as a member of the commission of business and professional men inquiring into the financial affairs of British Columbia. Mr. Mayhew is a former president of the Victoria board of trade and for years has been active in industrial affairs outside his own sphere of pulp and roofing production.

Japan's Pulp Imports—April, 1932

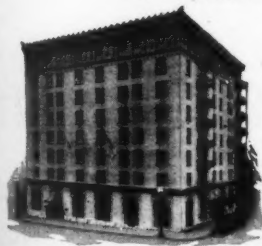
Japan imported chemical pulp from the following sources in April, 1932 (amounts stated in pounds): Canada, 1,442,267; U. S. A., 3,272,533; Norway, 6,022,400; Sweden, 5,005,600; Germany, 280,933; Holland, 90,400; Philippine, 32,933; other Europe, 2,706,533; total 18,853,599.

Stocker With Hawley

E. L. Stocker, formerly assistant secretary of the Bryant Paper Company of Kalamazoo, Michigan, has been brought to Oregon City as assistant to Felix Pagenstecher, president of Hawley Pulp & Paper Company. His title is assistant to the president.

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for Pulp and Paper Men



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The Care of FELTS

Felt seams should be straight across the machine. There is seldom any excuse for having them otherwise. When a felt is not started properly a strain develops which shortens the life of the felt.

Failure to raise the rolls when the machine is down for any length of time is hard on the felt.

Under the most favorable conditions, felt life is none too long, because of the severe type of service felts perform . . . all the more reason for insisting that all felts be properly adjusted to the machine.

Endless felts up to 86 feet in length. Top and bottom felts. Dryer felts. Every required weave, width and size used in the manufacture of paper.

Pacific Coast Representative: GEO. S. MEDDIS
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The Orr Felt & Blanket Co.

Piqua, Ohio



"Ta-Ta, you Trojans . . . we're going back to Greece"

Billet-doux of the Greeks to the Trojans which was pinned to the Trojan Horse was printed on stock made with Hamilton Felts. This is accepted as the reason why the document, only recently discovered at the South Pole, lasted these goodness-knows-how-many centuries.

From the very earliest times Hamilton Felts have played an important part in the making of recorded history as we know it today.

The most diligent research in the great archives of both the Old and the New World brings to light the fact that the first Hamilton Felt was made late in Pleistocene Age, about 1858 A. D.

During those 75 years Shuler & Benninghofen have accumulated the experience that results in the perfect Hamilton Felt which we know today.

For it is experience that dictates the choice of the wool, the methods of washing, of carding, of spinning, of weaving, and of fulling. And experience alone can dictate these things. Not yet has the making of a felt been reduced to the exactness and uniformity of an inflexible formula. There is no way to control the atmosphere and the way in which the sheep grow their wool. Each type of wool—each fleece—has its own characteristics.

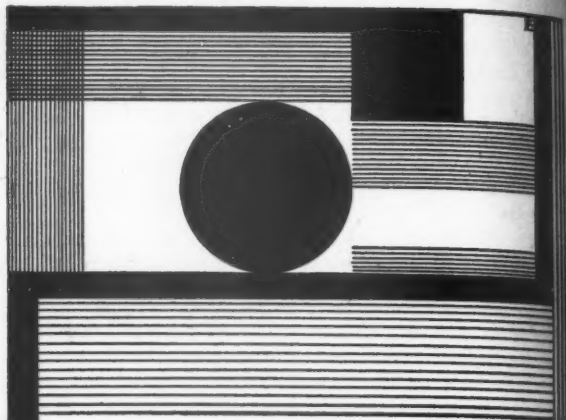
But because Shuler & Benninghofen have this experience they know how to make felts that make paper cheaper, better, and in more than usual quantities.

Try one Hamilton Felt and you'll never use any other. The Hamilton Felt is a better felt.

Shuler & Benninghofen, Hamilton, Ohio

Miami Woolen Mills, Established 1858

Hamilton *Felts*



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